

TOSHIBA

FILE NO. 810-200789GR

SERVICE MANUAL



HDD & DVD Video Recorder

RD-XS27KE



The above model is classified as a green product (*1), as indicated by the underlined serial number. This Service Manual describes replacement parts for the green product. When repairing this green product, use the part(s) described in this manual and lead-free solder (*2).

For (*1) and (*2), see the next page.

(*1)

GREEN PRODUCT PROCUREMENT

The EC is actively promoting the WEEE & RoHS Directives that define standards for recycling and reuse of Waste Electrical and Electronic Equipment and for the Restriction of the use of certain Hazardous Substances. From July 1, 2006, the RoHS Directive will prohibit any marketing of new products containing the restricted substances.

Increasing attention is given to issues related to the global environmental. Toshiba Corporation recognizes environmental protection as a key management tasks, and is doing its utmost to enhance and improve the quality and scope of its environmental activities. In line with this, Toshiba proactively promotes Green Procurement, and seeks to purchase and use products, parts and materials that have low environmental impacts.

Green procurement of parts is not only confined to manufacture. The same green parts used in manufacture must also be used as replacement parts.

(*2)

LEAD-FREE SOLDER

This product is manufactured using lead-free solder as a part of a movement within the consumer products industry at large to be environmentally responsible. Lead-free solder must be used in the servicing and repair of this product.

WARNING

This product is manufactured using lead free solder.

DO NOT USE LEAD BASED SOLDER TO REPAIR THIS PRODUCT !

The melting temperature of lead-free solder is higher than that of leaded solder by 86°F to 104°F (30°C to 40°C). Use of a soldering iron designed for lead-based solders to repair product made with lead-free solder may result in damage to the component and or BOARD being soldered. Great care should be made to ensure high-quality soldering when servicing this product — especially when soldering large components, through-hole pins, and on BOARDS — as the level of heat required to melt lead-free solder is high.

IMPORTANT SAFETY NOTICE

Proper service and repair is important to the safe, reliable operation of all TOSHIBA Equipment. The service procedures recommended by TOSHIBA and described in this service manual are effective methods of performing service operations. Some of these service special tools should be used when and as recommended.

It is important to note that this service manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. TOSHIBA could not possibly know, evaluate and advice the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, TOSHIBA has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by TOSHIBA must first use all precautions thoroughly so that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

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SPECIFICATIONS

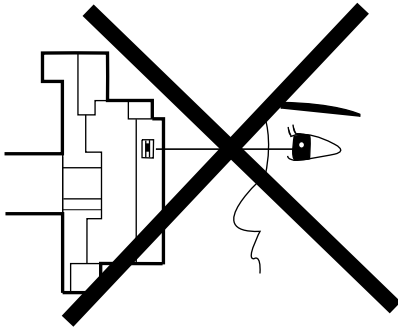
General	
System	HDD, DVD-Video, DVD-RW/-R, DVD+RW/+R, Video CD, CD-DA, CD-RW/-R
Power requirements	220–240 V ~ ± 10%, 50 Hz ± 0.5%
Power consumption	32 W (standby: 5 W)
Weight	3.7 kg
Dimensions (width x height x depth)	420 x 59 x 315 mm
Operating temperature	5°C to 40°C
Operating humidity	Less than 80% (no condensation)
TV format	PAL / SECAM - BG / DK
Recording	
Recording format	Video Recording (VR) format (DVD-RW only), Video format (DVD-RW, DVD-R) +VR format (DVD+RW, DVD+R)
Recordable discs	DVD-ReWritable, DVD-Recordable, DVD+ReWritable, DVD+Recordable
Video recording format	
Sampling frequency	13.5 MHz
Compression format	MPEG
Audio recording format	
Sampling frequency	48 kHz
Compression format	Dolby Digital
Tuner	
Receivable channels	E2 - E69
Input/Output	
Front Panel : (AV3)	
Video input	One RCA connector
Input level	1 Vp-p (75 Ω)
S-Video input	One Mini DIN 4-pin jack
Input level	Y (luminance) 1 Vp-p (75 Ω) C (colour) 300 mVp-p (75 Ω)
Audio input	Two RCA connectors
Input level	2 Vrms (input impedance: more than 10 kΩ)
Rear Panel :	
VHF/UHF antenna input/output terminal	75 Ω
Audio input /output	Two 21-pin scart sockets (AV1, AV2)
Video input /output	Two 21-pin scart sockets (AV1, AV2)
Input /output level	1 Vp-p (75 Ω) each
Component video output	Three RCA connectors
Output level	Y: 1.0 Vp-p (75 Ω) P _B /C _B , P _R /C _R : 0.7 Vp-p (75 Ω) each
Audio output	Two RCA connectors
Output level	2 Vrms (output impedance: 680 Ω)
Digital audio output	One Coaxial pin jack
Output level	500 mVp-p (75 Ω)
HDMI output	HDMI jack

Note

The specifications and design of this product are subject to change without notice.

LASER BEAM SAFETY PRECAUTIONS

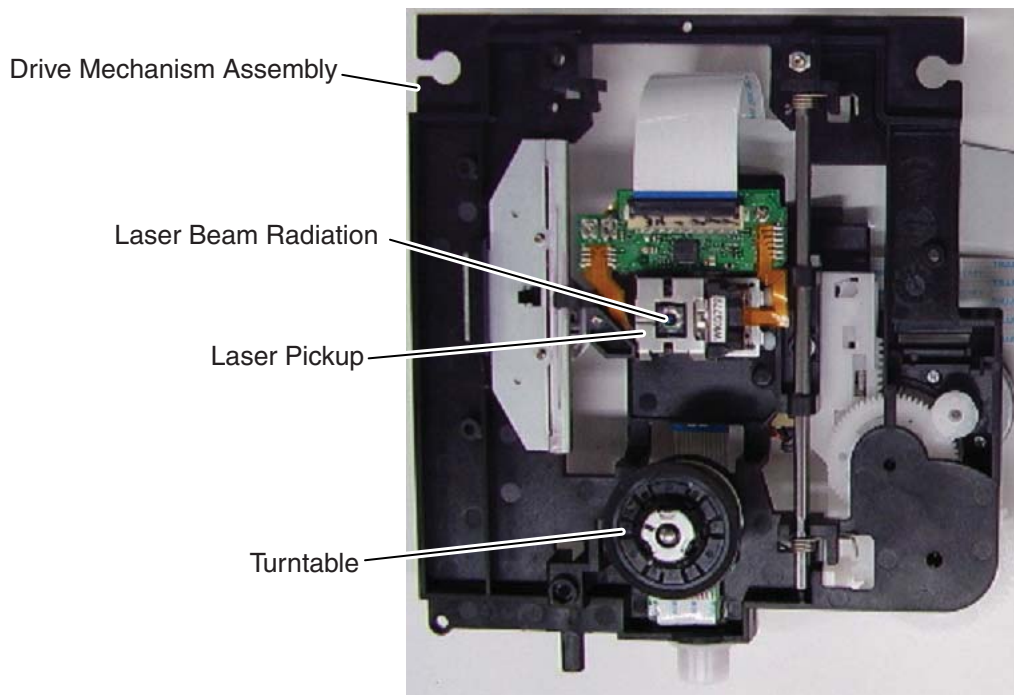
This DVD player uses a pickup that emits a laser beam.



Do not look directly at the laser beam coming from the pickup or allow it to strike against your skin.

The laser beam is emitted from the location shown in the figure. When checking the laser diode, be sure to keep your eyes at least 30 cm away from the pickup lens when the diode is turned on. Do not look directly at the laser beam.

CAUTION: Use of controls and adjustments, or doing procedures other than those specified herein, may result in hazardous radiation exposure.



CAUTION-CLASS 2M LASER
RADIATION WHEN OPEN
DO NOT STARE INTO THE BEAM
OR VIEW DIRECTLY WITH
OPTICAL INSTRUMENTS



Location: Inside Top of DVD mechanism.

IMPORTANT SAFETY PRECAUTIONS

Product Safety Notice

Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by a ⚠ on schematics and in parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards. The Product's Safety is under review continuously and new instructions are issued whenever appropriate. Prior to shipment from the factory, our products are carefully inspected to confirm with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

- K. When connecting or disconnecting the internal connectors, first, disconnect the AC plug from the AC outlet.

Precautions during Servicing

- A. Parts identified by the ⚠ symbol are critical for safety. Replace only with part number specified.
- B. In addition to safety, other parts and assemblies are specified for conformance with regulations applying to spurious radiation. These must also be replaced only with specified replacements.
Examples: RF converters, RF cables, noise blocking capacitors, and noise blocking filters, etc.
- C. Use specified internal wiring. Note especially:
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
- D. Use specified insulating materials for hazardous live parts. Note especially:
 - 1) Insulation tape
 - 2) PVC tubing
 - 3) Spacers
 - 4) Insulators for transistors
- E. When replacing AC primary side components (transformers, power cord, etc.), wrap ends of wires securely about the terminals before soldering.
- F. Observe that the wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.).
- G. Check that replaced wires do not contact sharp edges or pointed parts.
- H. When a power cord has been replaced, check that 5 - 6 kg of force in any direction will not loosen it.
- I. Also check areas surrounding repaired locations.
- J. Be careful that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts, and wires have been returned to their original positions. Afterwards, do the following tests and confirm the specified values to verify compliance with safety standards.

1. Clearance Distance

When replacing primary circuit components, confirm specified clearance distance (d) and (d') between soldered terminals, and between terminals and surrounding metallic parts. (See Fig. 1)

Table 1 : Ratings for selected area

AC Line Voltage	Clearance Distance (d), (d')
220 to 240 V	$\geq 3 \text{ mm}(d)$ $\geq 6 \text{ mm}(d')$

Note: This table is unofficial and for reference only.
Be sure to confirm the precise values.

2. Leakage Current Test

Confirm the specified (or lower) leakage current between B (earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.) is lower than or equal to the specified value in the table below.

Measuring Method (Power ON) :

Insert load Z between B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across the terminals of load Z . See Fig. 2 and the following table.

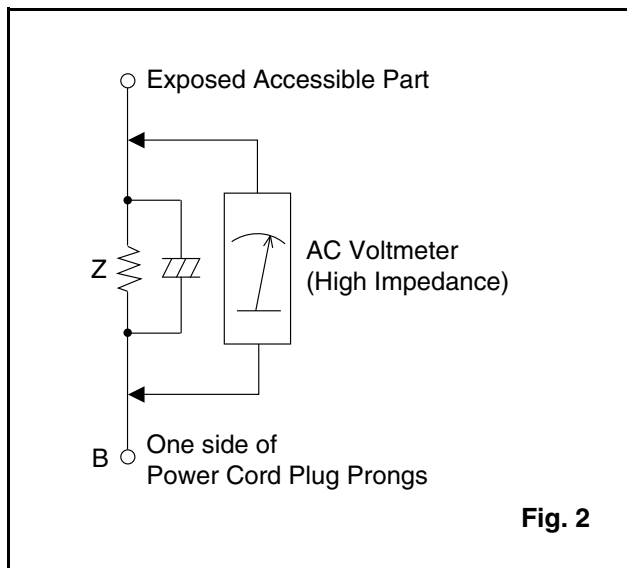
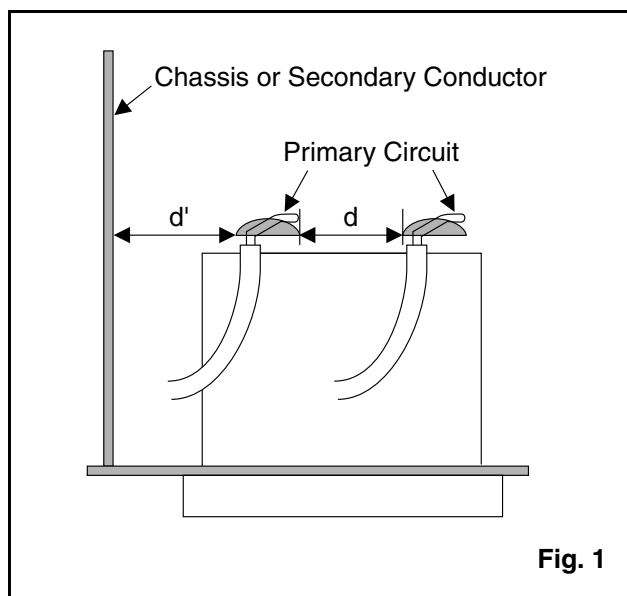


Table 2: Leakage current ratings for selected areas

AC Line Voltage	Load Z	Leakage Current (i)	One side of power cord plug prongs (B) to:
220 to 240 V	2k Ω RES. Connected in parallel	$i \leq 0.7 \text{ mA AC Peak}$ $i \leq 2 \text{ mA DC}$	RF or Antenna terminals
	50k Ω RES. Connected in parallel	$i \leq 0.7 \text{ mA AC Peak}$ $i \leq 2 \text{ mA DC}$	A/V Input, Output

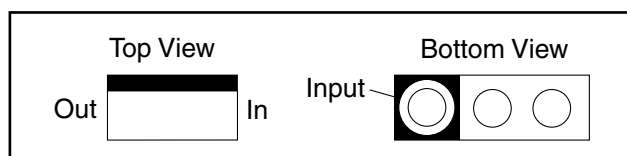
Note: This table is unofficial and for reference only. Be sure to confirm the precise values.

STANDARD NOTES FOR SERVICING

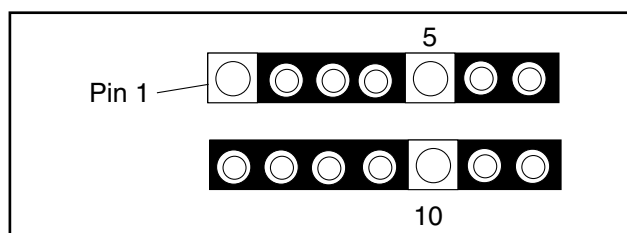
NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

Circuit Board Indications

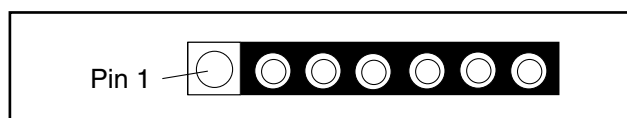
1. The output pin of the 3 pin Regulator ICs is indicated as shown.



2. For other ICs, pin 1 and every fifth pin are indicated as shown.

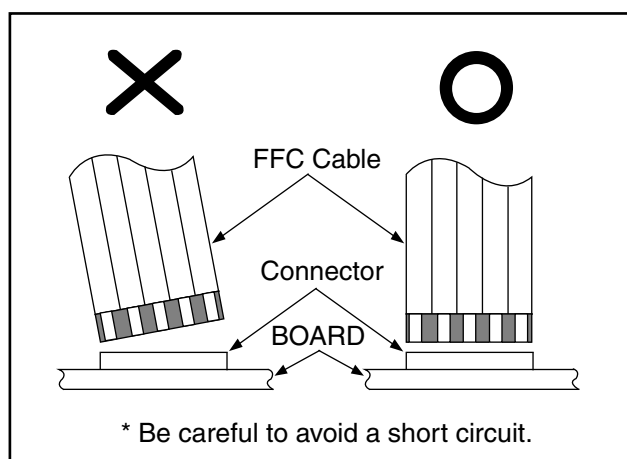


3. The 1st pin of every male connector is indicated as shown.



Instructions for Connectors

1. When you connect or disconnect the FFC (Flexible Foil Connector) cable, be sure to first disconnect the AC cord.
2. FFC (Flexible Foil Connector) cable should be inserted parallel into the connector, not at an angle.



Pb (Lead) Free Solder

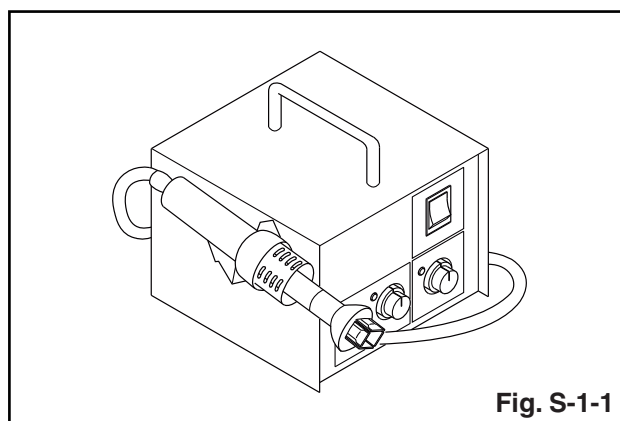
When soldering, be sure to use the Pb free solder.

How to Remove / Install Flat Pack-IC

1. Removal

With Hot-Air Flat Pack-IC Desoldering Machine:

1. Prepare the hot-air flat pack-IC desoldering machine, then apply hot air to the Flat Pack-IC (about 5 to 6 seconds). (Fig. S-1-1)

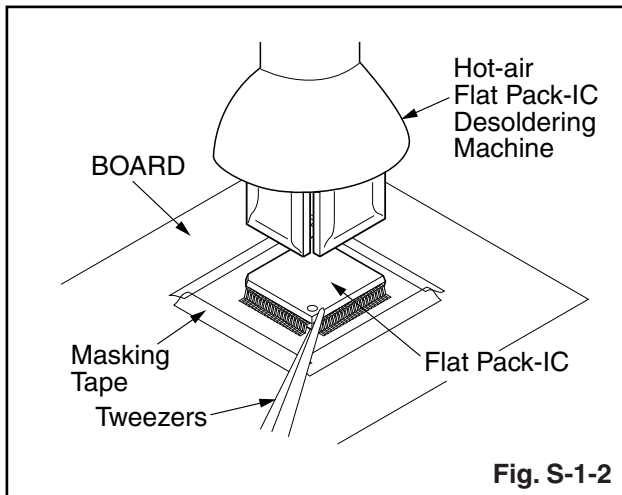


2. Remove the flat pack-IC with tweezers while applying the hot air.
3. Bottom of the flat pack-IC is fixed with glue to the BOARD; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the BOARD using tweezers. (Fig. S-1-6)

CAUTION:

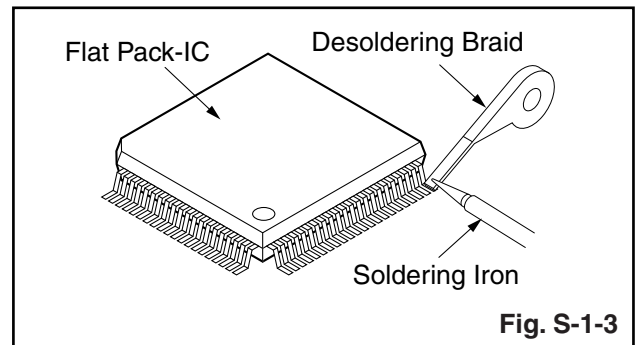
1. The Flat Pack-IC shape may differ by models. Use an appropriate hot-air flat pack-IC desoldering machine, whose shape matches that of the Flat Pack-IC.
2. Do not supply hot air to the chip parts around the flat pack-IC for over 6 seconds because damage to the chip parts may occur. Put masking tape around the flat pack-IC to protect other parts from damage. (Fig. S-1-2)

3. The flat pack-IC on the BOARD is affixed with glue, so be careful not to break or damage the foil of each pin or the solder lands under the IC when removing it.

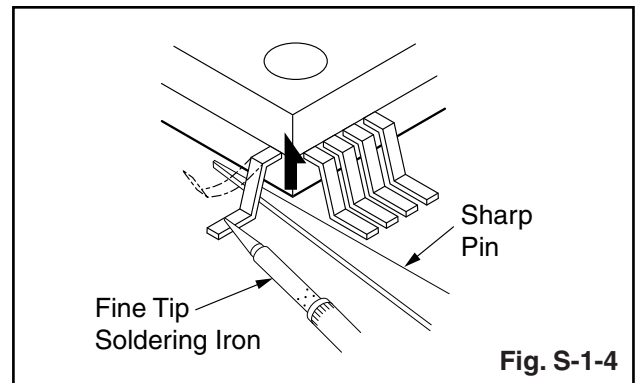


With Soldering Iron:

1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)



2. Lift each lead of the flat pack-IC upward one by one, using a sharp pin or wire to which solder will not adhere (iron wire). When heating the pins, use a fine tip soldering iron or a hot air desoldering machine. (Fig. S-1-4)

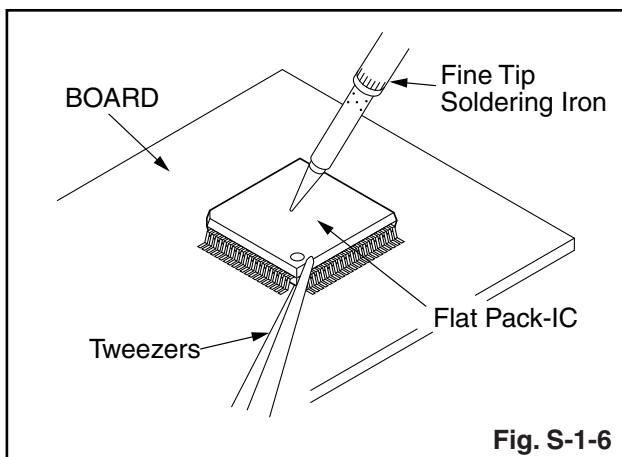
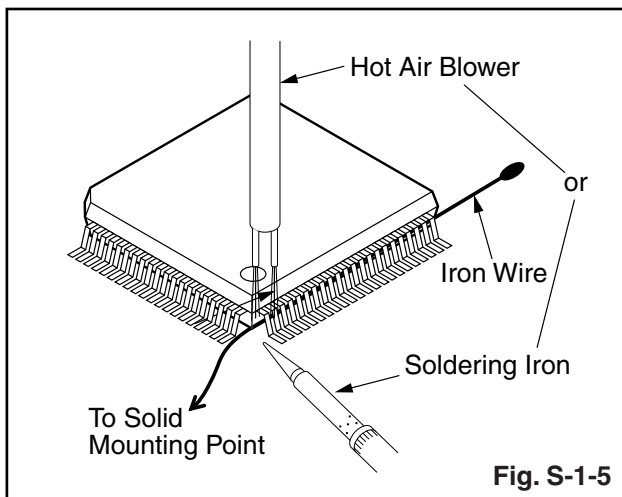


3. Bottom of the flat pack-IC is fixed with glue to the BOARD; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
4. Release the flat pack-IC from the BOARD using tweezers. (Fig. S-1-6)

With Iron Wire:

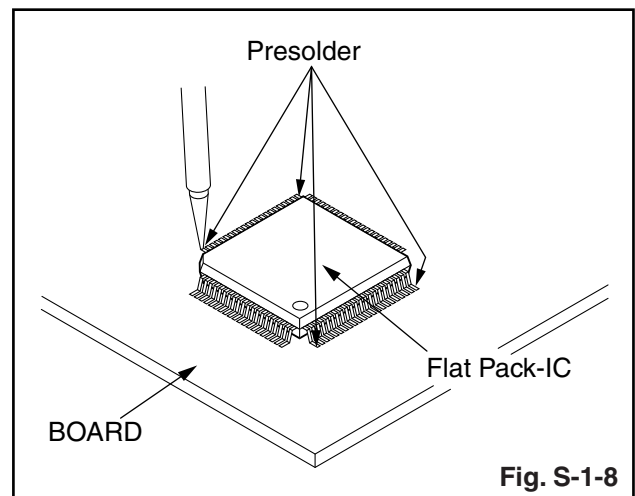
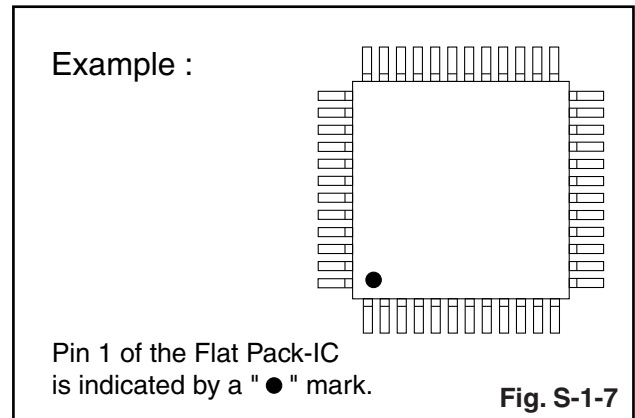
1. Using desoldering braid, remove the solder from all pins of the flat pack-IC. When you use solder flux which is applied to all pins of the flat pack-IC, you can remove it easily. (Fig. S-1-3)
2. Affix the wire to a workbench or solid mounting point, as shown in Fig. S-1-5.
3. While heating the pins using a fine tip soldering iron or hot air blower, pull up the wire as the solder melts so as to lift the IC leads from the BOARD contact pads as shown in Fig. S-1-5.
4. Bottom of the flat pack-IC is fixed with glue to the BOARD; when removing entire flat pack-IC, first apply soldering iron to center of the flat pack-IC and heat up. Then remove (glue will be melted). (Fig. S-1-6)
5. Release the flat pack-IC from the BOARD using tweezers. (Fig. S-1-6)

Note: When using a soldering iron, care must be taken to ensure that the flat pack-IC is not being held by glue. When the flat pack-IC is removed from the BOARD, handle it gently because it may be damaged if force is applied.



2. Installation

1. Using desoldering braid, remove the solder from the foil of each pin of the flat pack-IC on the BOARD so you can install a replacement flat pack-IC more easily.
2. The "●" mark on the flat pack-IC indicates pin 1. (See Fig. S-1-7.) Be sure this mark matches the 1 on the BOARD when positioning for installation. Then presolder the four corners of the flat pack-IC. (See Fig. S-1-8.)
3. Solder all pins of the flat pack-IC. Be sure that none of the pins have solder bridges.



Instructions for Handling Semi-conductors

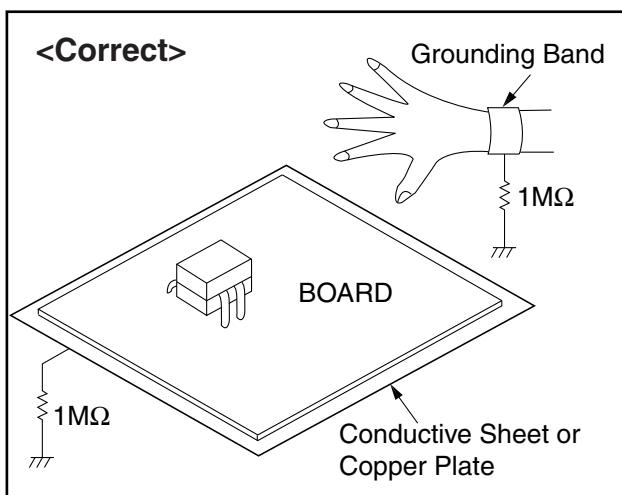
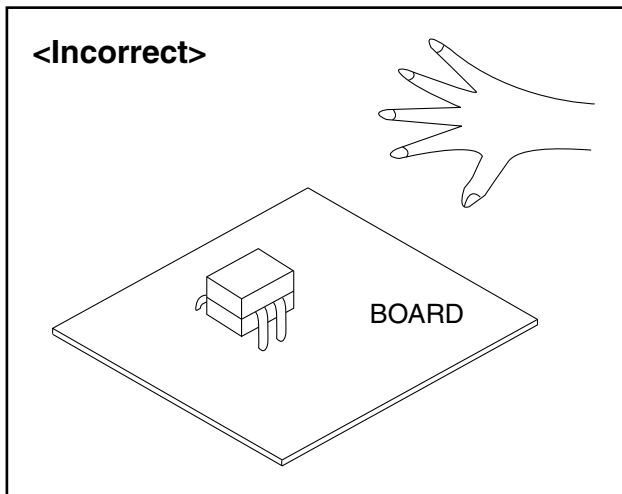
Electrostatic breakdown of the semi-conductors may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

1. Ground for Human Body

Be sure to wear a grounding band (1 MΩ) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1 MΩ) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing.



HANDLING PRECAUTIONS FOR HDD

CAUTION:

1. SHOCK

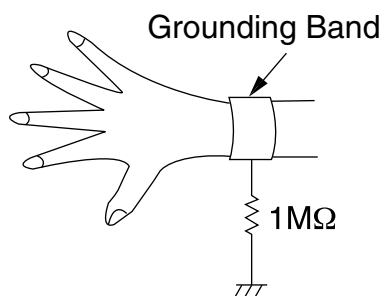
- a. Exposing HDD to shock may be the biggest damaging factor. Please note that HDD is easily damaged even if dropped from any height. Be sure to place HDD on a shock-absorbent mat. Also, be careful when transporting HDD.
- b. Be careful not to subject HDD to any shock when tightening screws for HDD replacement.
(Tighten screws manually, not with an electric driver.)

2. MOISTURE

- a. Moisture may also be a damaging factor. HDD is semiclosed style. Sudden changes in ambient temperature may cause moisture to form. Monitor temperature and do not allow moisture to form on the media surface. Also, when opening HDD package, do so only after package is at ambient temperature.
- b. After replacing HDD, leave it to reach room temperature (about 2 hours) for preventing dew internal condensation, and then work necessary task such as operation check.

3. STATIC ELECTRICITY

- a. After removing HDD or taking replacement HDD out of the protective bag (the replacement HDD is packed in a protective bag), place HDD on a conductive surface. A grounding band should be worn when handling.



Both the conductive surface and grounding band should be grounded.

- b. Make sure that HDD is placed on main unit completely and then let go of it, when assembling.
- c. Do not put HDD on a packing bag. (for preventing electrostatic damage)

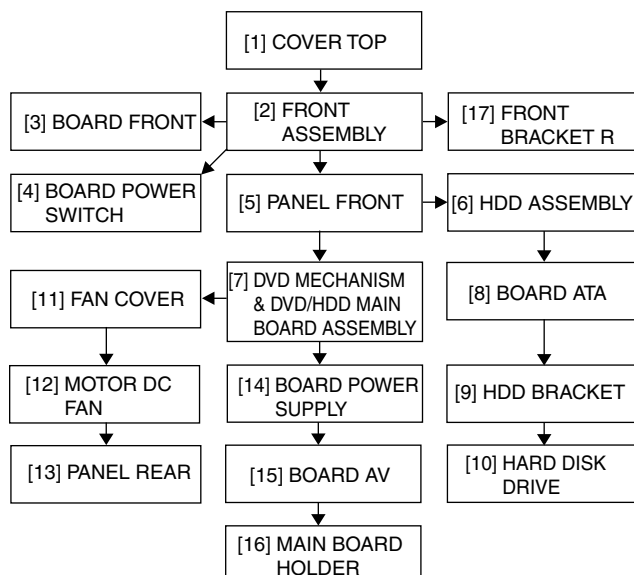
4. OTHERS

- a. Be careful so as not to do the followings. Otherwise, HDD might be damaged.
 - **DO NOT** disassemble HDD.
 - When handling HDD, be sure to hold both sides securely.
- b. HDD should be stored, packed in the protective bag, in suitable surroundings (i.e., no extreme changes in temperature to avoid condensation).
- c. When transporting HDD, be sure to use the exclusive packing case (the replacement HDD carton).
- d. Do not stack HDDs.
- e. Do not place vertically because HDD is unstable and easy to fall.

CABINET DISASSEMBLY INSTRUCTIONS

1. Disassembly Flowchart

This flowchart indicates the disassembly steps to gain access to item(s) to be serviced. When reassembling, follow the steps in reverse order. Bend, route, and dress the cables as they were originally.



ID/ LOC. No.	PART	REMOVAL		
		Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	Note
[10]	HARD DISK DRIVE	D5	(S-9), HDD PLATE EARTH	3
[11]	FAN COVER	D6	2(S-10)	---
[12]	MOTOR DC FAN	D6	FAN EARTH, *CN1601	---
[13]	PANEL REAR	D6	(S-11), 2(S-12), (S-13)	---
[14]	BOARD POWER SUPPLY	D7	*CN1152, 4(S-14), POWER HOLDER	---
[15]	BOARD AV	D7	5(S-15)	---
[16]	MAIN BOARD HOLDER	D7	(S-16)	---
[17]	FRONT BRACKET R	D7	(S-17)	---
		(1)	(2)	(3)
		(4)	(5)	

2. Disassembly Method

ID/ LOC. No.	PART	REMOVAL		
		Fig. No.	REMOVE/*UNHOOK/ UNLOCK/RELEASE/ UNPLUG/DESOLDER	Note
[1]	COVER TOP	D1	8(S-1)	---
[2]	FRONT ASSEMBLY	D2	*CN2204, *5(L-1), *3(L-2)	1
[3]	BOARD FRONT	D3	*CN3001-F, 4(S-2A)	---
[4]	BOARD POWER SWITCH	D3	(S-2B)	---
[5]	PANEL FRONT	D3	-----	---
[6]	HDD ASSEMBLY	D4	*CN1015, *CN651, 3(S-3)	---
[7]	DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY	D4	(S-4), 4(S-5), (S-6), *CN101, *CN701, *CN901, BOARD SUPPORT/ BOARD SPACERS, M-BOARD PLATE EARTH	2
[8]	BOARD ATA	D5	*CN3001-A	---
[9]	HDD BRACKET	D5	4(S-8)	---

Note:

(1): Identification (location) No. of parts in the figures

(2): Name of the part

(3): Figure Number for reference

(4): Identification of parts to be removed, unhooked, unlocked, released, unplugged, unclamped, or desoldered.

P=Spring, L=Locking Tab, S=Screw, CN=Connector

*=Unhook, Unlock, Release, Unplug, or Desolder

e.g. 7(S-1) = seven Screws (S-1), 5(L-1) = five Locking Tabs (L-1)

(5): Refer to "Reference Notes."

Reference Notes

1. Locking Tabs (L-1) ,(L-2) are fragile. Be careful not to break them.
 - 1-1. Release five Locking Tabs (L-1).
 - 1-2. Release three Locking Tabs (L-2) and remove the PANEL FRONT.
2. **The DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY is adjusted as a unit at factory. Therefore, do not disassemble it. Replace the DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY as a unit.**
3. Whenever you have replaced the Hard Disk Drive, initialize the Hard Disk Drive. To initialize the Hard Disk Drive, perform the following.
 - 3-1. To put the HDD & DVD Video Recorder into the HDD mode, press the [HDD] button on the remote control unit.
 - 3-2. To put the HDD & DVD Video Recorder into the self-check mode, after pressing [VARIABLE SKIP] button, press the [0], [7], and [9] buttons on the remote control unit in that order within three seconds.
 - 3-3. Press [ENTER] button. The HDD & DVD Video Recorder is initialized and the power is turned off automatically after two seconds.

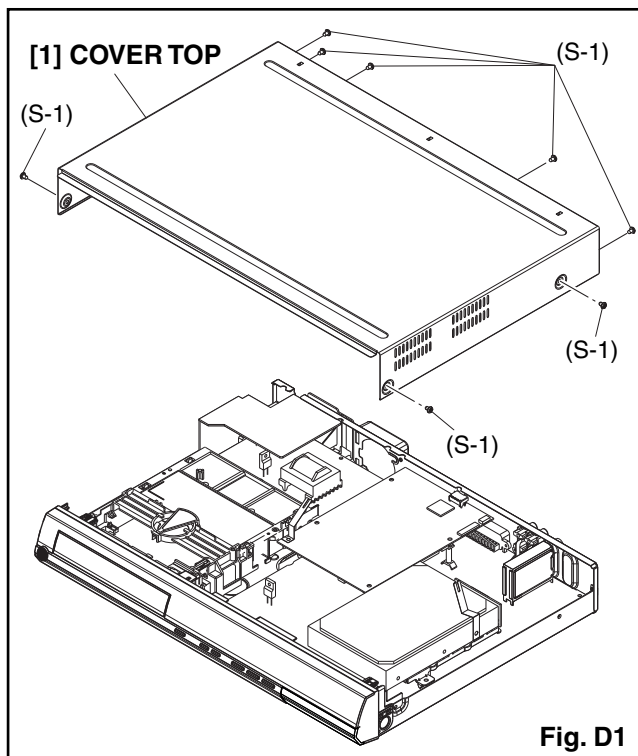


Fig. D1

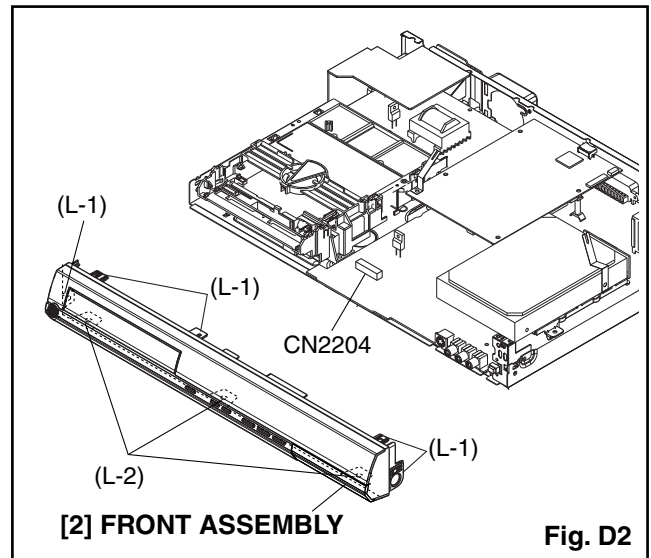


Fig. D2

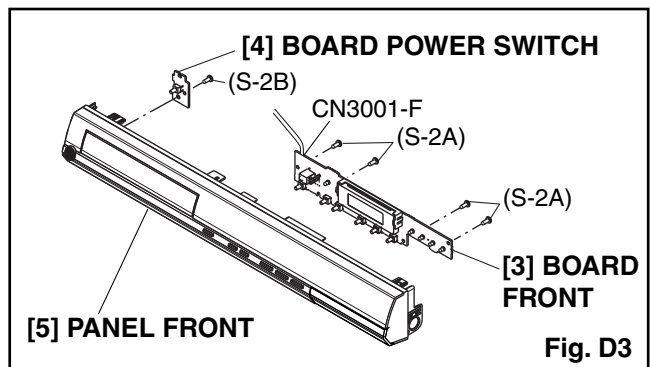


Fig. D3

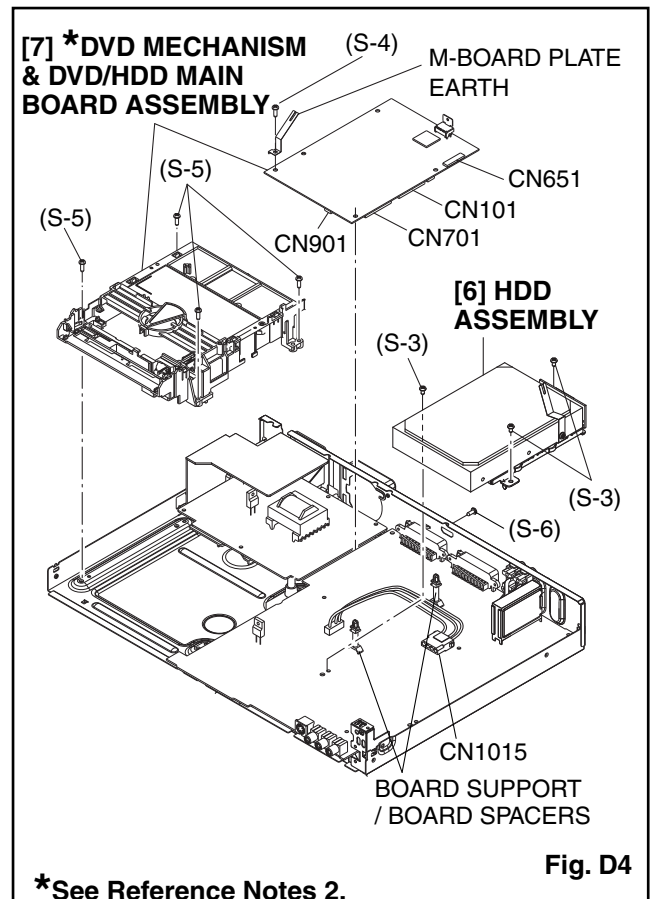
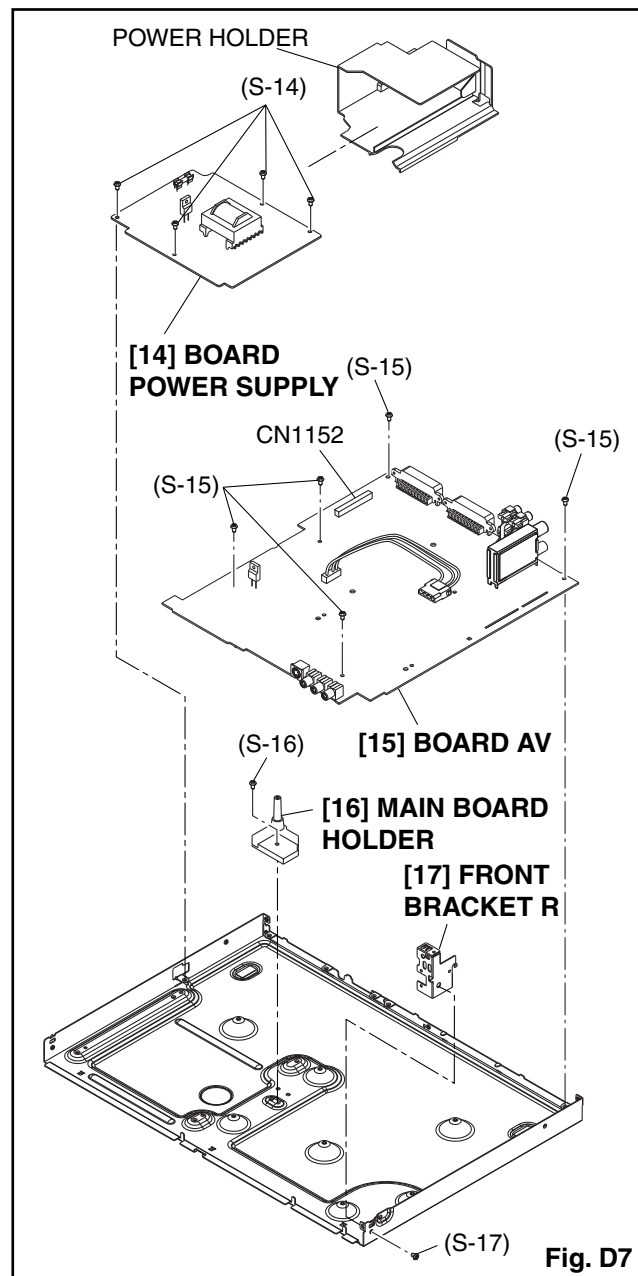
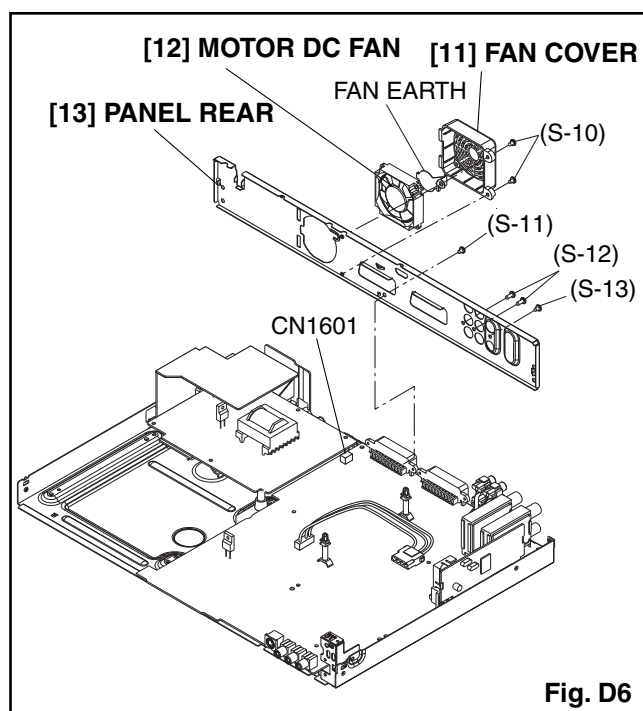
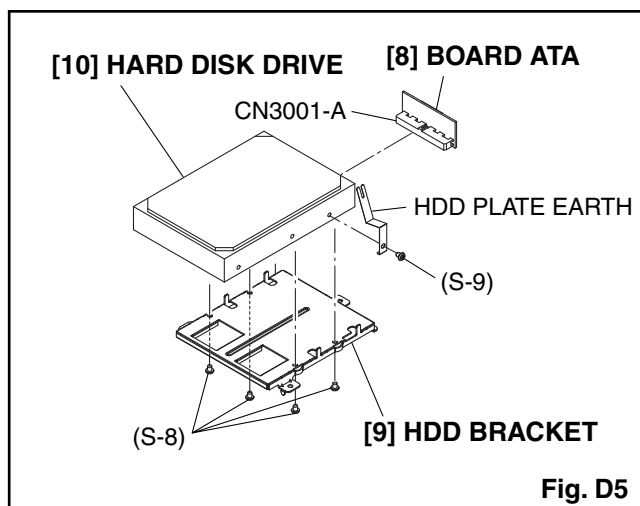


Fig. D4

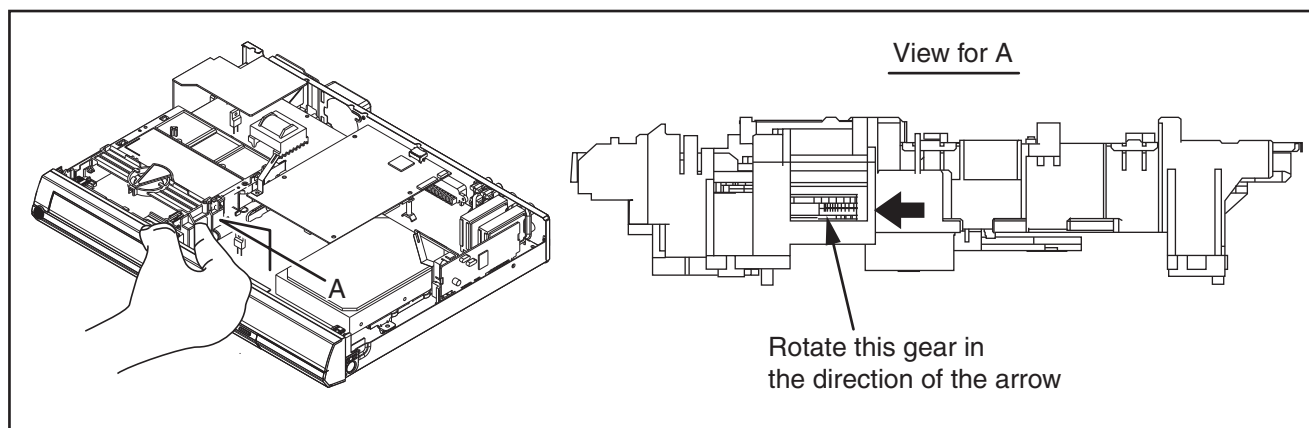
*See Reference Notes 2.



3. How to Eject Manually

Note: When rotating the gear, be careful not to damage the gear.

1. Remove the COVER TOP.
2. Rotate the gear in the direction of the arrow manually as shown below until the tray descends.
3. Pull the tray out manually and remove a disc.



HOW TO SELF-CHECK AND INITIALIZE THE HDD & DVD VIDEO RECORDER

1. Turn on the HDD & DVD Video Recorder.
2. To put the HDD & DVD Video Recorder into the HDD mode, press [HDD] on the remote control unit.
3. To put the HDD & DVD Video Recorder into the self-check mode, after pressing [VARIABLE SKIP] button, press the [0], [7], and [9] buttons on the remote control unit in that order within three seconds.
Fig. a appears on the screen and all LEDs light.

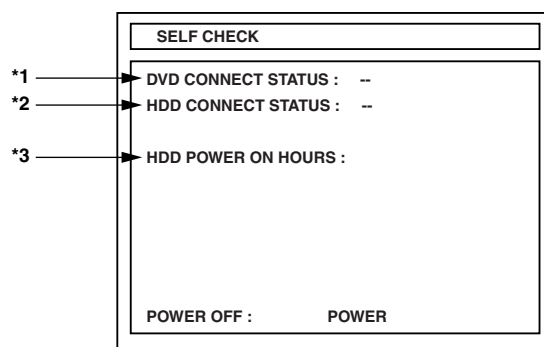


Fig. a: Self-Check Mode Screen

Table 1: Description of Fig. a

INDICATION	DESCRIPTION
DVD CONNECT STATUS (*1)	Connecting Condition of DVD(F/E)
HDD CONNECT STATUS (*2)	Connecting Condition of HDD
HDD POWER ON HOURS (*3)	Value of HDD power on hours obtained from S.M.A.R.T. command. (If not obtainable, value of HDD power on hours is "0".) Value in parentheses is the factory setting value. (If no setting, the value is "0".)

4. Upon the self-check completion, Fig. b appears on the screen.

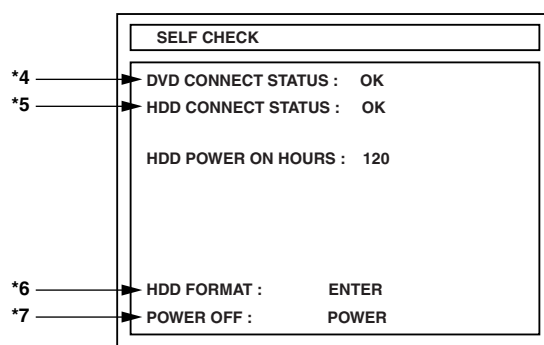


Fig. b: Screen of Finishing Self-Check Mode

Table 2: Indication of DVD self-check (*4)

INDICATION	DESCRIPTION
OK	Connection of DVD is normal.
NOT FOUND	DVD drive cannot be found.
CABLE ERROR	FFC cable (connecting to CN401) between the DVD drive and the DVD/HDD MAIN BOARD is not connected correctly.

Table 3: Indication of HDD self-check (*5)

INDICATION	DESCRIPTION
OK	Connection of HDD is normal.
NOT FOUND	HDD drive cannot be found.
CABLE ERROR	FFC cable between the BOARD ATA and the HDD drive is not connected correctly.

Table 4: Available button in self-check mode

BUTTON	DESCRIPTION
ENTER (*6)	Initialize (only when the self-check mode is complete)
STANDBY-ON (*7)	Turn the power off (when the self-check mode is complete)
OTHER	Not available

5. When the self-check mode is complete, press [I/⏻] button to turn the power off.
When initializing the HDD & DVD Video Recorder, press [ENTER] button. After two seconds, the power is turned off automatically.

NOTE: When initializing, “Current Clock”, “Setup Changing Item”, “Channel Setup”, “Area Setup”, “Program” and “HDD Contents” are initialized.

FIRMWARE RENEWAL MODE

1. Turn the power on and remove the disc on the tray.
2. To put the HDD & DVD Video Recorder into version up mode, press [VARIABLE SKIP], [6], [5], and [4] buttons on the remote control unit in the order. Then the tray will open automatically. Fig. a appears on the screen and Fig. b appears on the VFD.

* Firmware Version differs depending on the models, and this indication is one example.

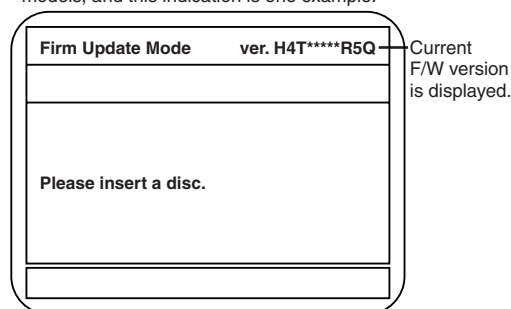


Fig. a Version Up Mode Screen

F - UP

Fig. b VFD in Version Up Mode

3. Load the disc for version up. Fig. c appears on the screen. The file on the top is highlighted as the default. When there is only one file to exist, Step 4 will start automatically.

* Firmware Version differs depending on the models, and this indication is one example.

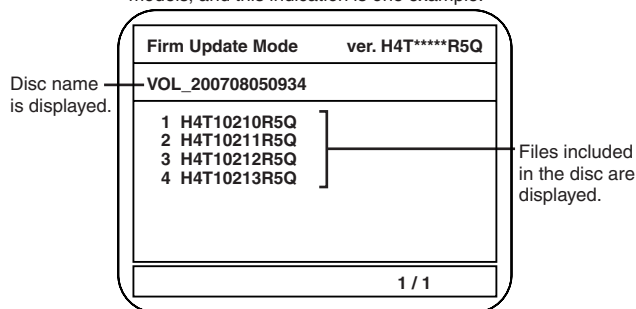


Fig. c Update Disc Screen

4. Select the firmware version pressing arrow buttons, then press [ENTER]. Fig. d appears on the screen and Fig. e appears on the VFD. The HDD & DVD Video Recorder starts updating.

About VFD indication of Fig. e:

- 1) When Fig. d is displayed on the screen, "F-UP" is displayed on the VFD.
- 2) When "Firmware Updating... XX% Complete." is displayed on the screen, "02110" is displayed on the VFD.

* Firmware Version differs depending on the models, and this indication is one example.

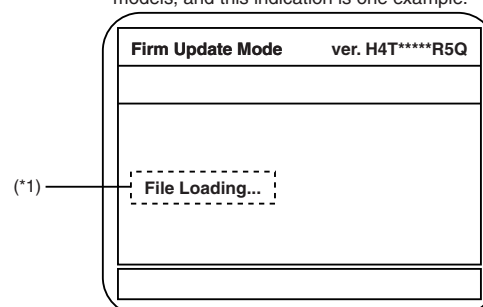


Fig. d Programming Mode Screen

10210

Fig. e VFD in Programming Mode (Example)

The appearance shown in (*1) of Fig. d is described as follows.

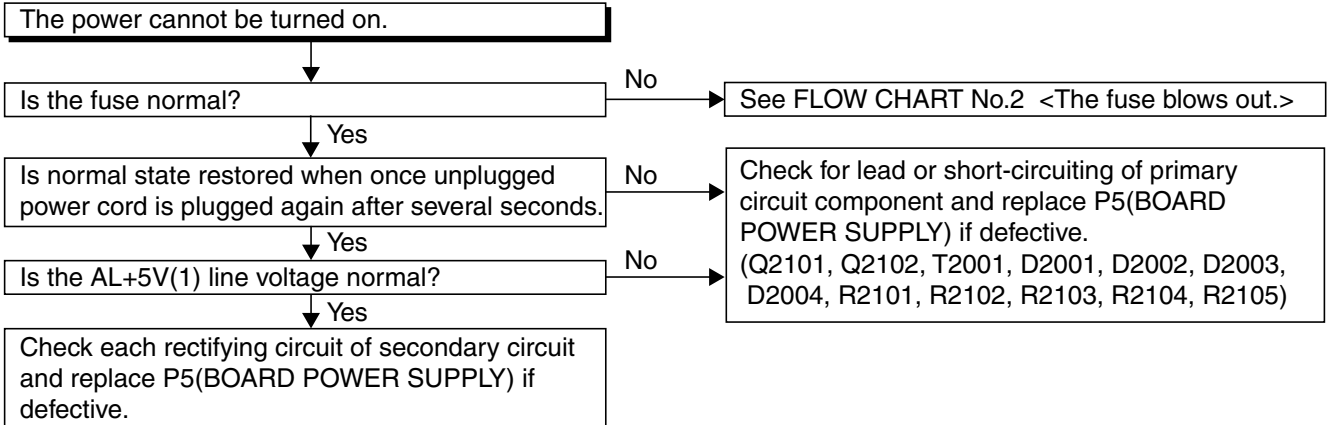
No.	Appearance	State
1	File Loading...	Sending files into the memory
2	Firmware Updating... XX% Complete.	Writing new version data
---	Error	Failed in updating

5. After updating is finished, the tray opens automatically. At this time, no button is available.
6. Pull out the AC code once, then insert it again.

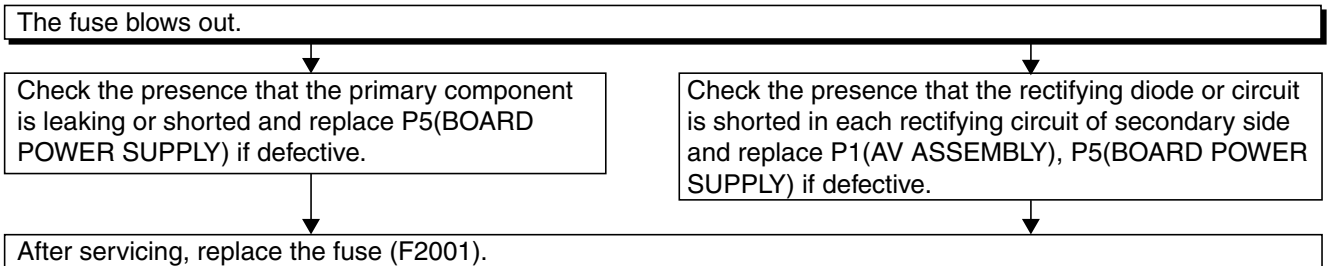
TROUBLESHOOTING

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

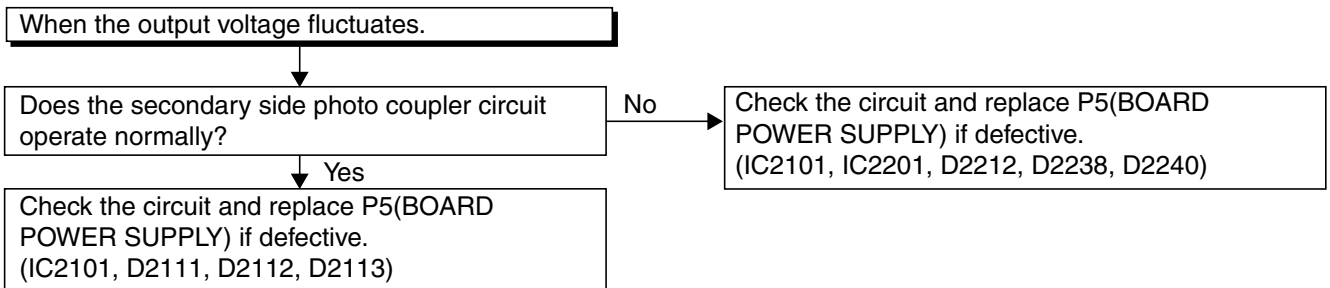
FLOW CHART NO.1



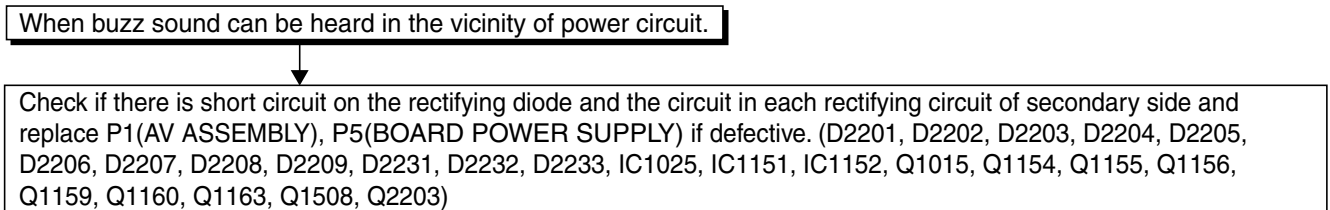
FLOW CHART NO.2



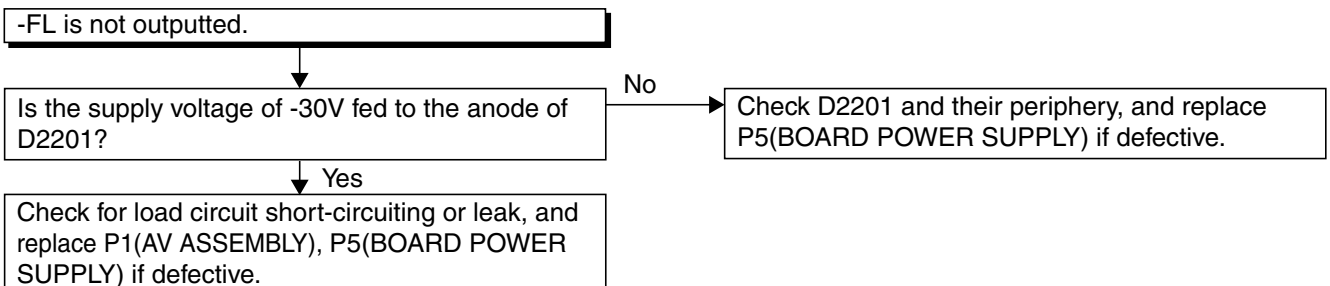
FLOW CHART NO.3



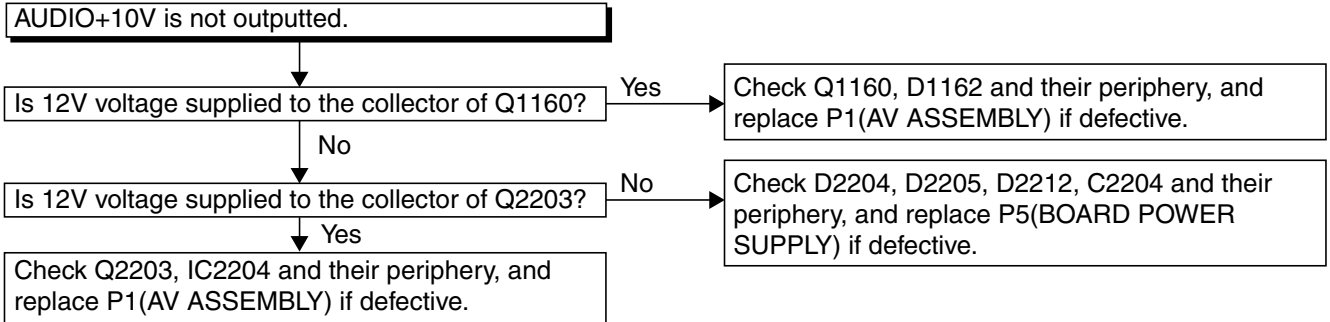
FLOW CHART NO.4



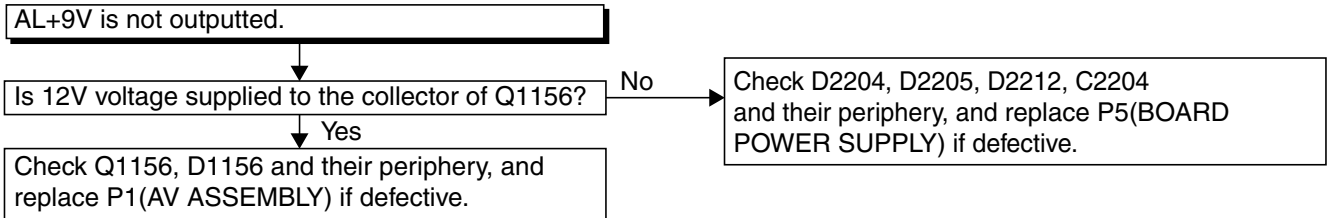
FLOW CHART NO.5



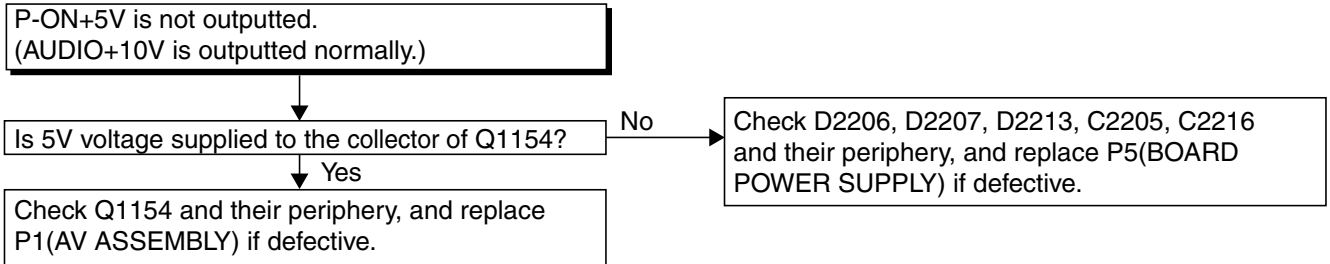
FLOW CHART NO.6



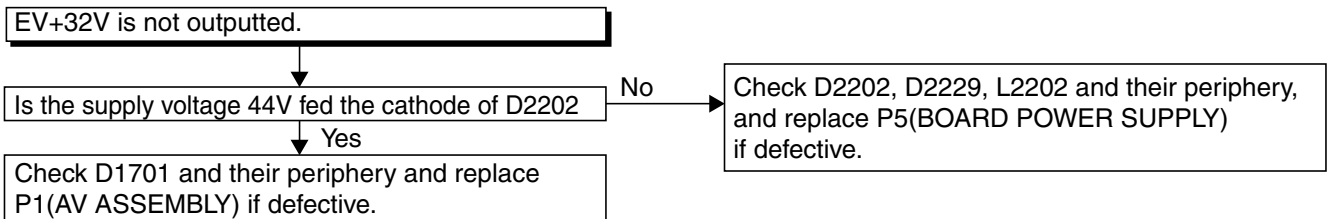
FLOW CHART NO.7



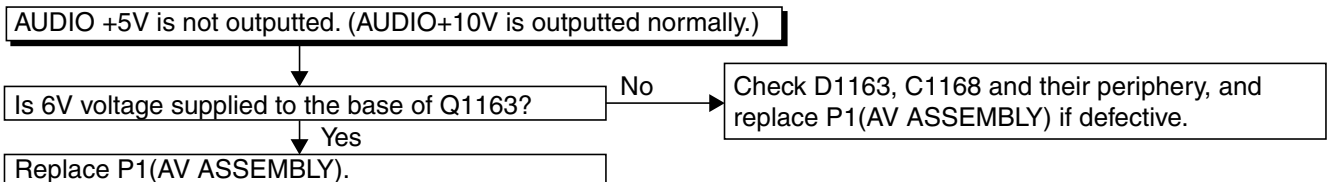
FLOW CHART NO.8



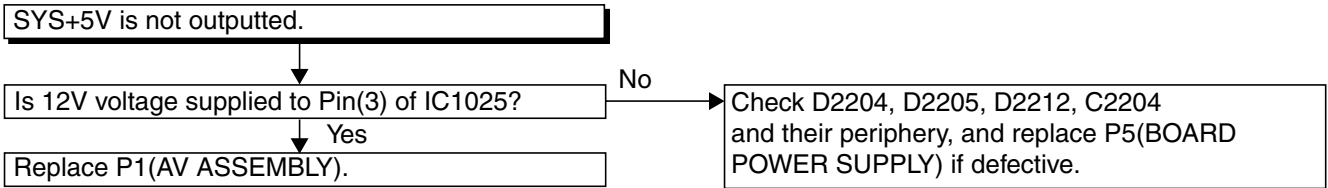
FLOW CHART NO.9



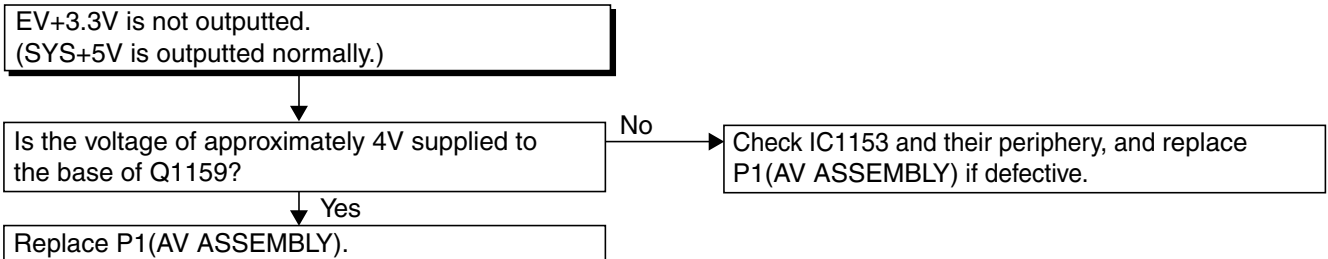
FLOW CHART NO.10



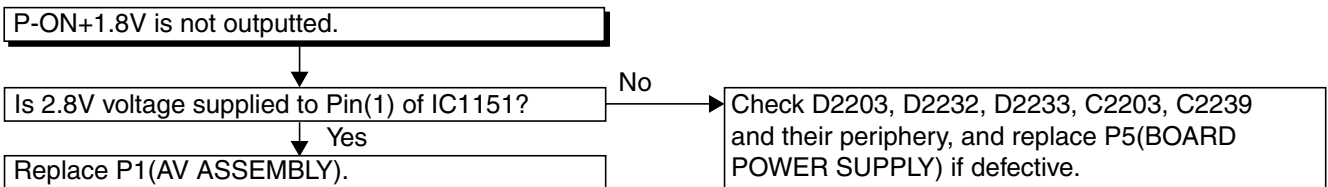
FLOW CHART NO.11



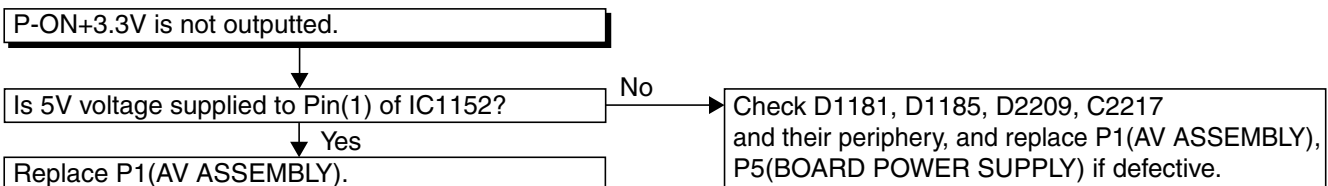
FLOW CHART NO.12



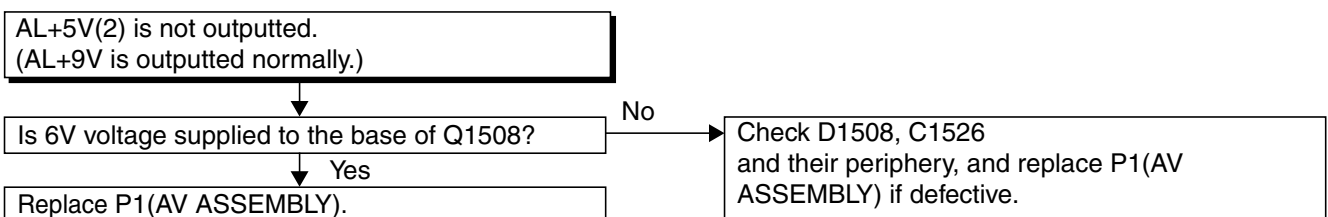
FLOW CHART NO.13



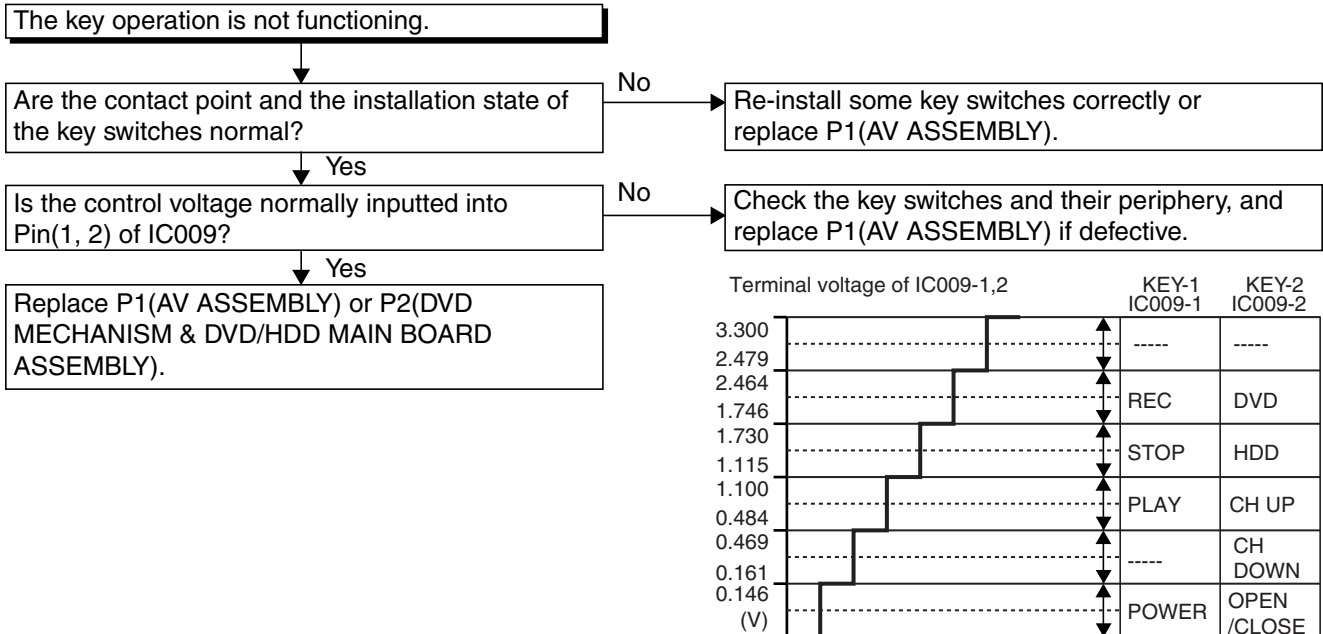
FLOW CHART NO.14



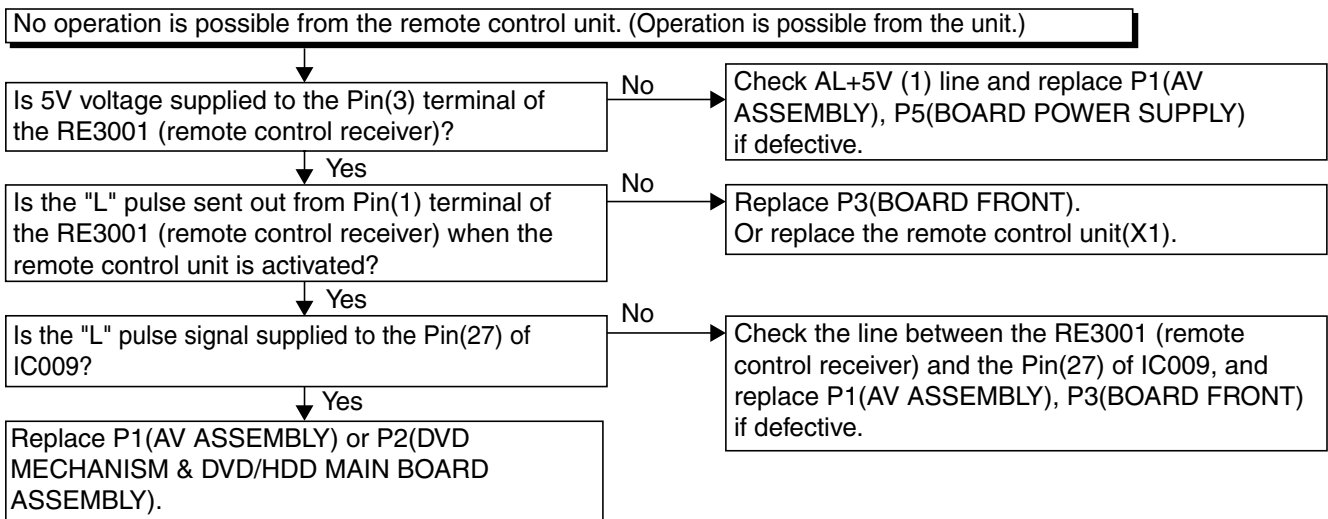
FLOW CHART NO.15



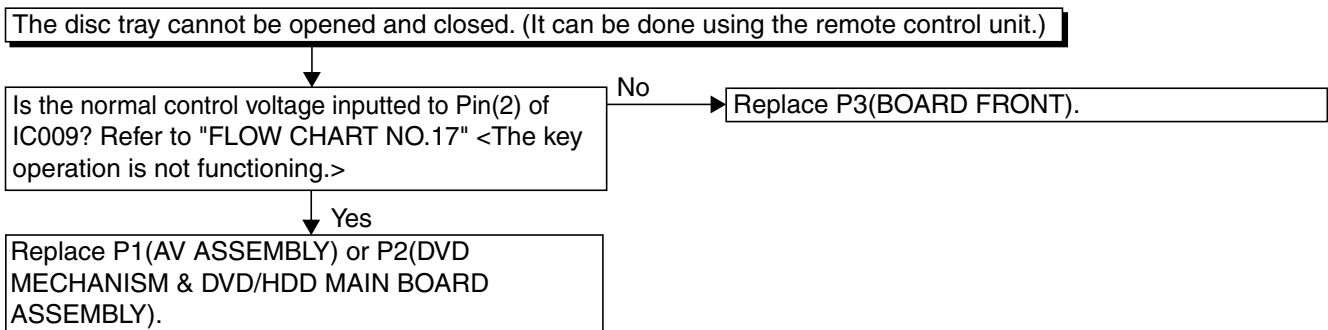
FLOW CHART NO.16



FLOW CHART NO.17



FLOW CHART NO.18



FLOW CHART NO.19

[No Disc] indicated.
Both functions of picture and sound do not operate normally.

Replace P2(DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY).

FLOW CHART NO.20

VIDEO E-E does not appear normally.

Are the video signals inputted to each pin of IC005?

IC005	16PIN	VIDEO-IN 1 (AV1)
IC005	14PIN	VIDEO-IN (FRONT)
IC005	7PIN	Y-IN 1 (FRONT)
IC005	9PIN	C-IN 1 (FRONT)
IC005	12PIN	VIDEO-IN 2 (AV2)
IC005	20PIN	TUNER-VIDEO

No

Check the line between video input terminal and each pin of IC005 and replace P1(AV ASSEMBLY) if defective.

IC005	16PIN → JK1206	VIDEO-IN 1 (AV1)
IC005	14PIN → JK1201	VIDEO-IN (FRONT)
IC005	7PIN → JK1212	Y-IN 1 (FRONT)
IC005	9PIN → JK1212	C-IN 1 (FRONT)
IC005	12PIN → JK1207	VIDEO-IN 2 (AV2)
IC005	20PIN → TU1701	TUNER-VIDEO 17PIN

Yes

Are the video signals outputted to each pin of IC005?

IC005	61PIN	VIDEO-Y/CVBS-IN
IC005	59PIN	VIDEO-C-IN

No

Is 5V voltage supplied to the Pin(27,29,47,63) of IC005?

Yes

Replace P1(AV ASSEMBLY).

No

Check AL+5V(2) line and replace P1(AV ASSEMBLY), P5(BOARD POWER SUPPLY) if defective.

Yes

Are the video signals outputted to each pin of CN1201?

CN1201	20PIN	VIDEO-Y/CVBS-IN
CN1201	22PIN	VIDEO-C-IN

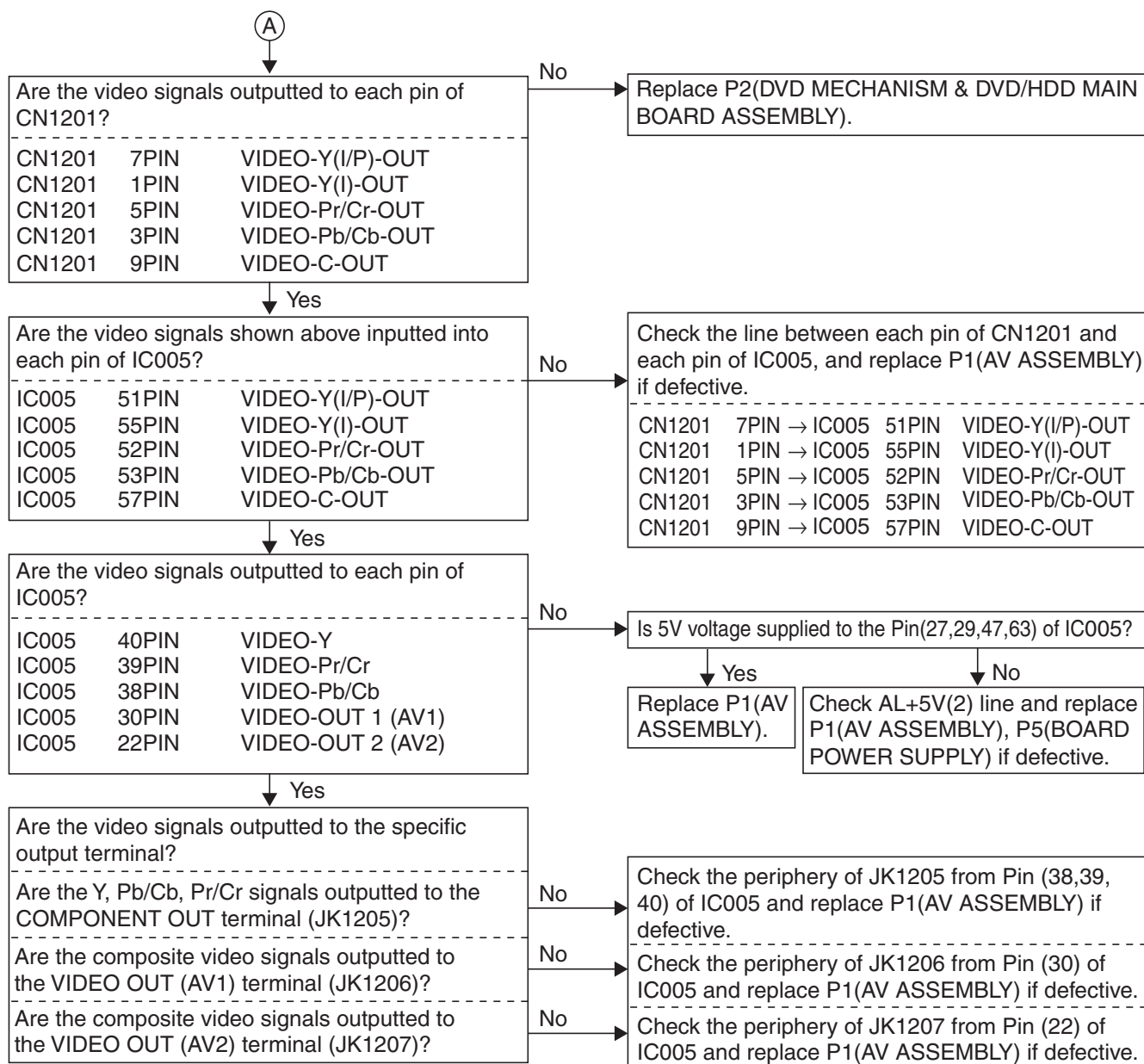
No

Check the line between each pin of IC005 and each pin of CN1201 and replace P1(AV ASSEMBLY) if defective.

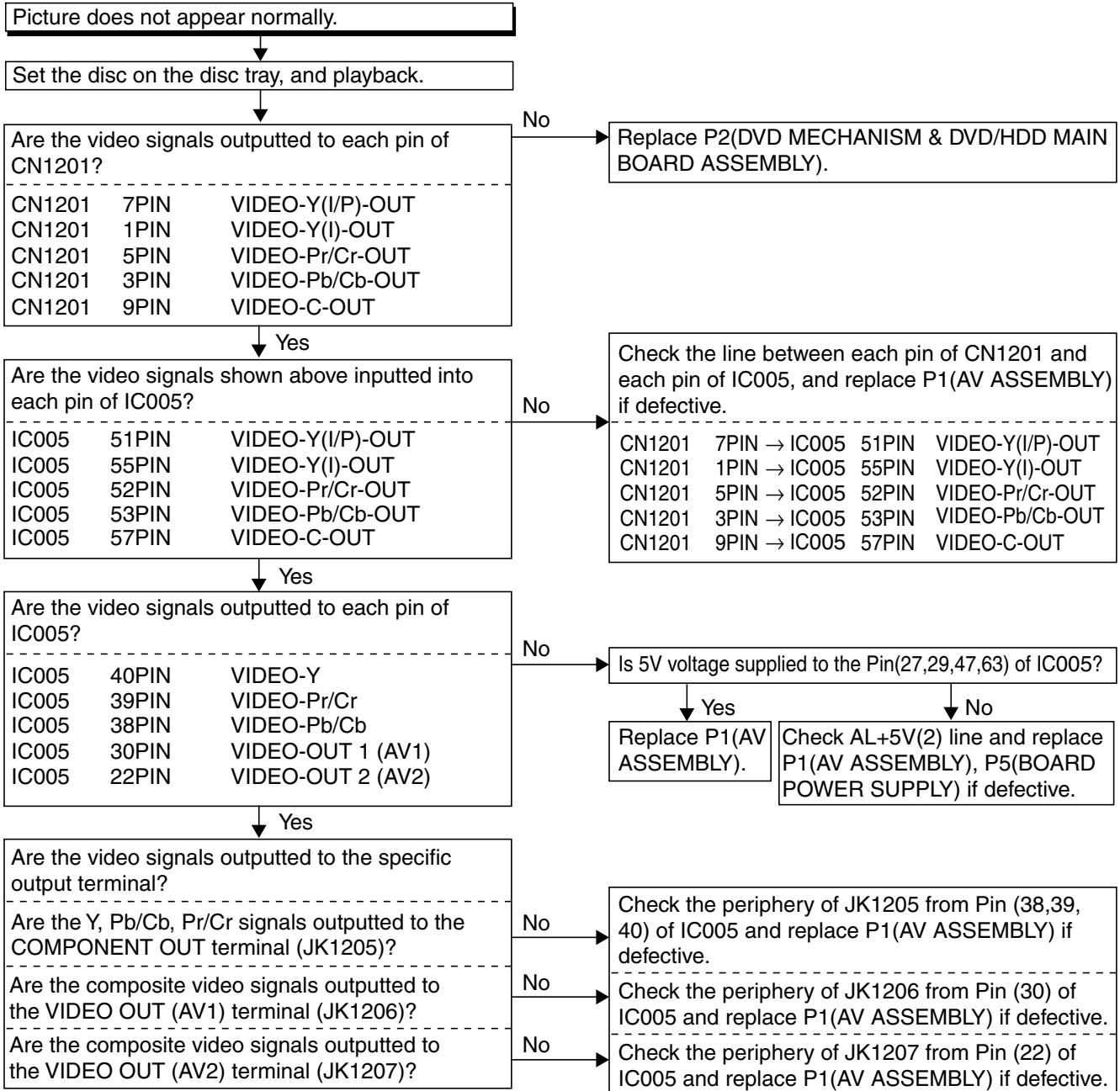
IC005	61PIN → CN1201	20PIN	VIDEO-Y/CVBS-IN
IC005	59PIN → CN1201	22PIN	VIDEO-C-IN

Yes

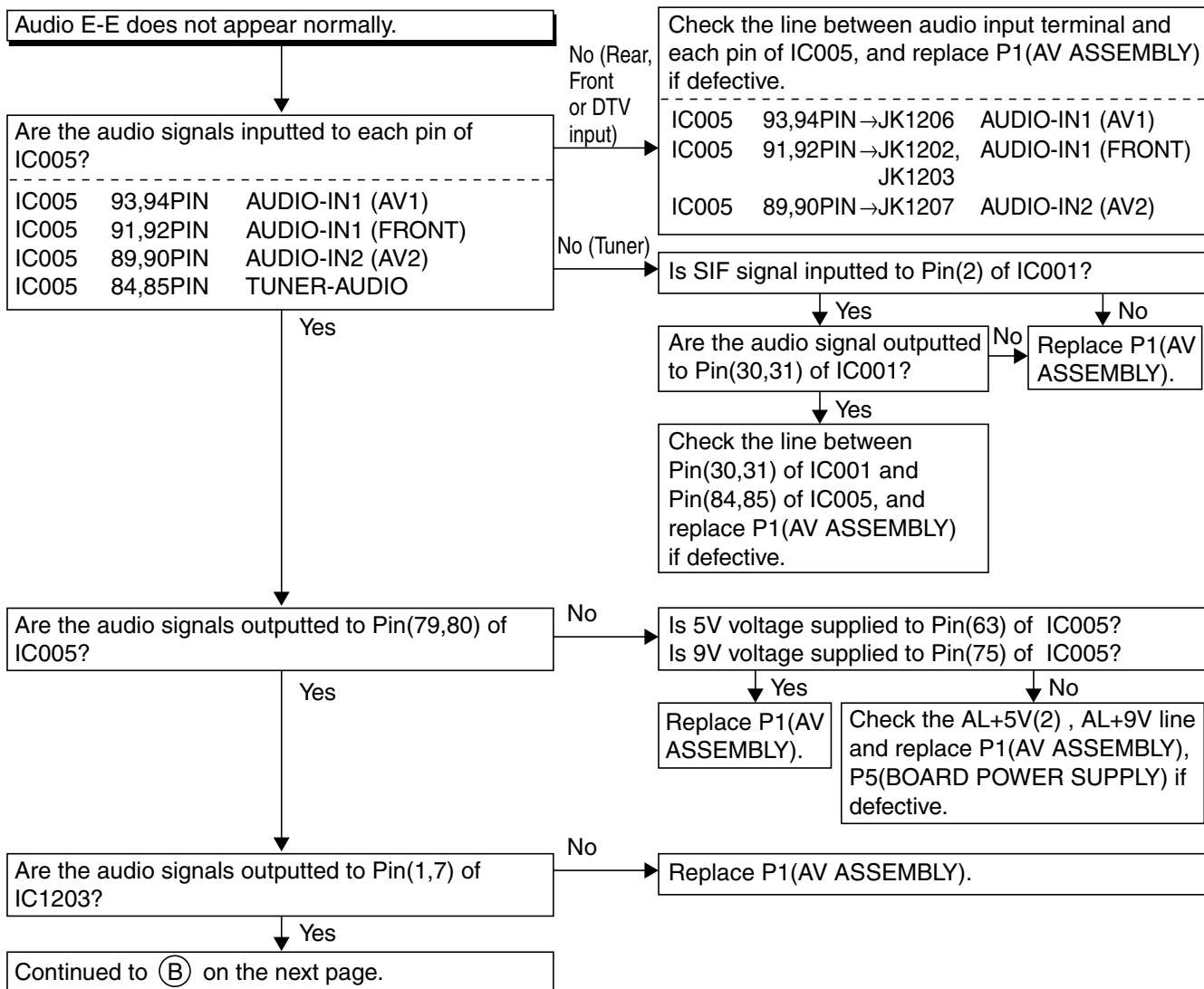
Continued to (A) on the next page.

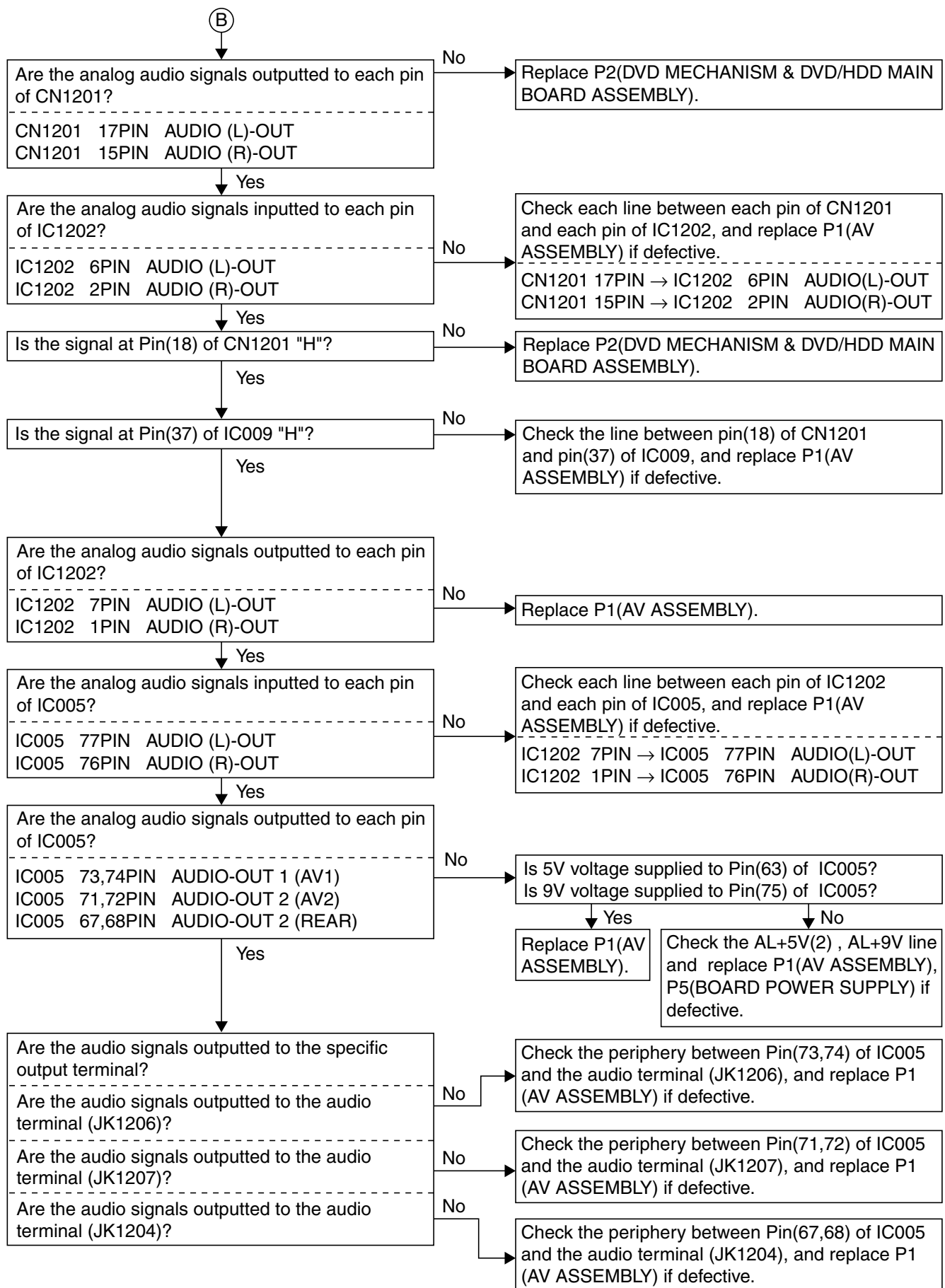


FLOW CHART NO.21

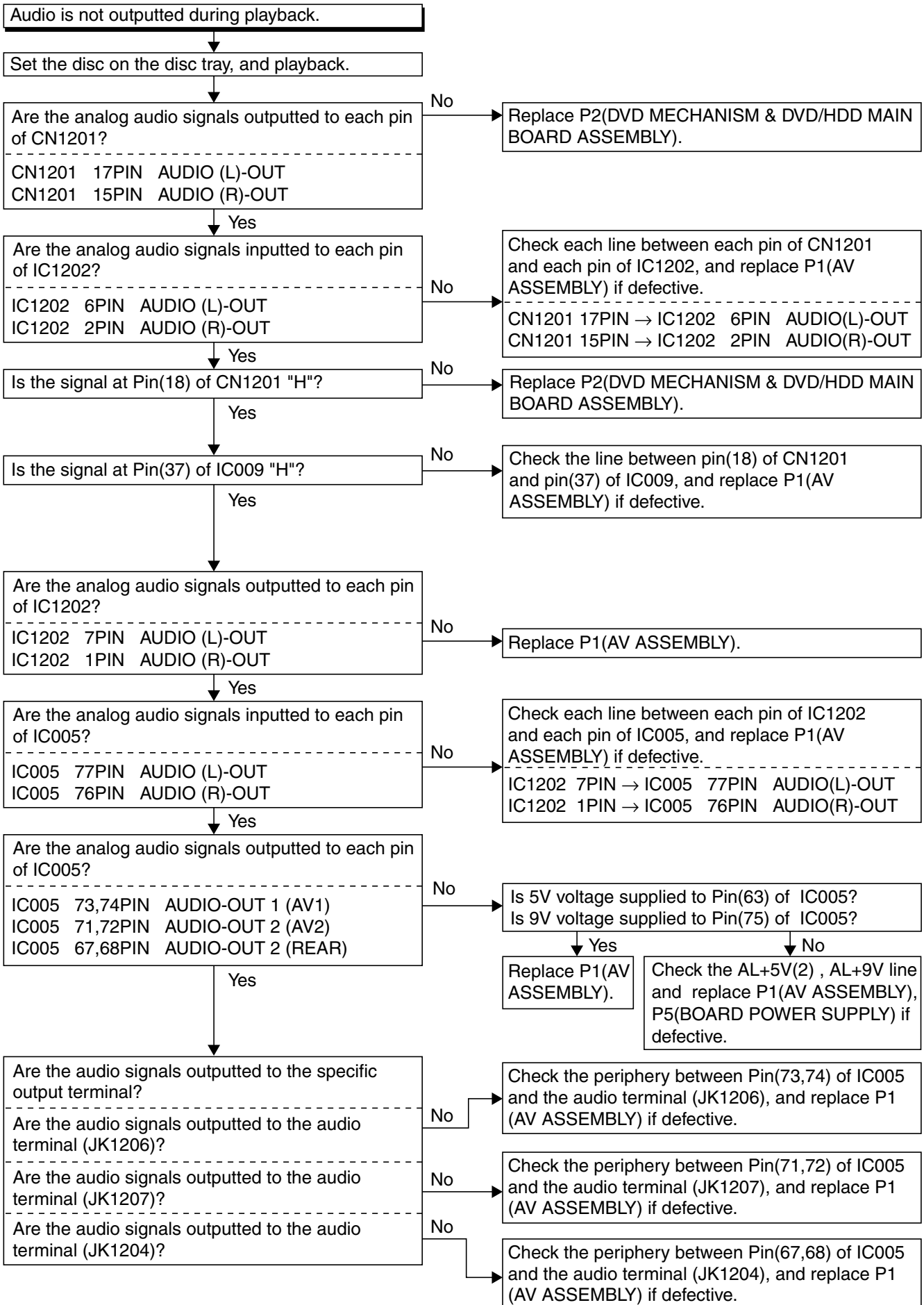


FLOW CHART NO.22



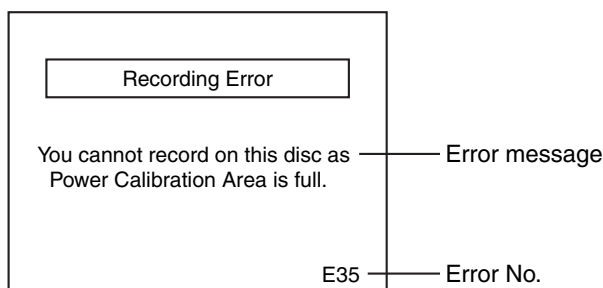


FLOW CHART NO.23



FUNCTION INDICATOR SYMBOLS

Note: If a recording error occurs, a message with the error number appears on the screen.



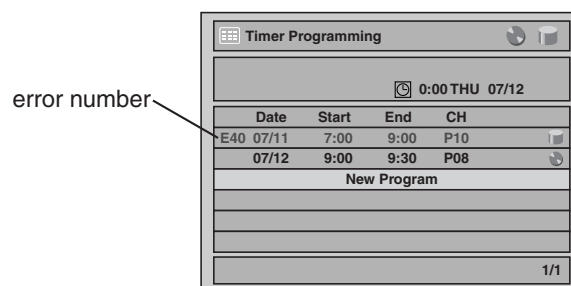
Message	Solution	Error No.	Error Description	Priority
Can not record on this disc.	Insert a recordable disc, and ensure the disc status satisfies the recording requirements.	1	An error occurs during data reading.	-
		2	There is no reply for 15 seconds in Test Unit Ready.	-
		3	Cannot write the data after trying three times.	-
		4	An error occurs with OPC.	-
		5	During recovery in a record.	-
		6	An error occurs even if recovery has been tried three times.	-
		7	An error occurs in a format.	-
		8	It cannot start an encode.	-
		9	NV_PCK/RDI_PCK is not in encoded data.	-
		10	Encode Pause condition continued for 10 minutes.	-
		11	Encode Pause condition continued in normal REC condition for 10 minutes.	-
		12	Difference in the address and cannot get Stream ID of RDI/VIDEO.	-
		13	It is a reply that "ATAPI is not readable."	-
		14	Cannot write the data after recovering SMALL VMGI.	-
		15	Cannot write the data after DVD-R Reverse Track.	-
		16	An error occurs in Finalize Close.	-
		17	An error occurs in Rec Stop Close.	-
		18	An error occurs in PCA Full (DVD_R).	-
		19	Safety Stop occurs during editing.	-
		20	High Speed Disc.	2
		21	The disc is not formatted.	5
		22	Disc Error has occurred.	3
		24	The disc except DVD-R/RW or finalized DVD-R.	1
This program is not allowed to be recorded.	You cannot record copy-prohibited programs.	25	During the Macrovision picture input.	11
		26	During the CGMS picture input.	12
This program is not recordable in Video mode.	You cannot record copy-prohibited programs.	27	During the CGMS picture input. (Video Format Disc)	-
This program is not allowed to be recorded on this disc.	You cannot record copy-prohibited programs.	28	During the CGMS picture input. (VR Format Disc)	-
This disc is protected and not recordable.	Release the disc protection setting in the Disc Setting menu.	29	Disc Protected Disc.	6

Message	Solution	Error No.	Error Description	Priority
Disc is full. (No area for new recording)	Insert a recordable disc with enough recording space.	30	No available recording space.	10
You cannot record more than 99 titles on one disc. (The maximum is 99.)	Delete unnecessary titles.	31	The 99 title limit has been reached. (Video Format Disc)	-
		32	The 99 title limit has been reached. (VR Format Disc)	-
You cannot record more than 999 chapters on one disc. (The maximum is 999.)	Delete unnecessary chapters.	33	999 chapter limit has been reached. (VR Format Disc)	-
You cannot record on this as Control Information is full.	Insert a new disc.	34	No available recording space for Control Information.	-
You cannot record on this disc as Power Calibration Area is full.	Insert a new disc.	35	PCA is Full. (in REC start)	4
This disc is already finalized.	Release the finalizing for this disc.	36	It is finalized. (Video Format Disc)	8
Can not record on this disc.	Repeat the same operation.	37	Access to outside of Memory Area.	-
		38	Sector Address is wrong.	-
		39	BUP writing error of chapter editing.	-
You cannot record more than 49 titles on the disc. (The maximum is 49.)	Delete unnecessary titles.	43	The 49 title limit has been reached. (+VR Format Disc)	9
You cannot record more than 254 chapters on the disc. (The maximum is 254.)	Delete unnecessary chapter marks.	44	The 254 chapter limit has been reached. (+VR Format Disc)	10
This program is not recordable in +VR mode.	You cannot record copy-prohibited programs.	45	During the CGMS picture input (+VR Format Disc).	12
The disc has no recording compatibility. Set "Make Recording Compatible" to "ON" to convert the disc.	Set "Make Recording Compatible" to "ON" to convert the disc.	46	Trying to record onto the +VR formatting disc that had been recorded by the other recorder when "Make Recording Compatible" setting is "OFF",	7
You cannot record more than 600 titles on HDD. (The maximum is 600.)	Delete unnecessary titles.	47	The 600 title limit has been reached (HDD).	-
Can not record on this HDD.	Connect HDD.	48	Recording without HDD connected.	-
	Delete unnecessary programs.	49	HDD is Full.	-

If an error occurs during the timer recording, one of the following error numbers (40 to 42) or the above error messages (error number: 1 to 39 and 43 to 49) is displayed on the recording menu after timer recording.

(Once the screen of the program line is exited, the program line for the error will be cleared.)

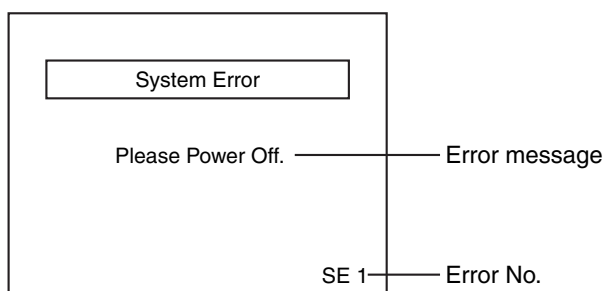
(No Error Message is displayed for errors No. 40 ~ 42.)



A program with the error number is grayed out on the timer programming list.

Message	Solution	Error No.	Error Description	Priority
Error message is not displayed.	- Set the timer programming correctly. - Set the timer programming before the start time.	40	- Some portion has not been recorded because of program overlapping. - Recording did not start at the start time.	-
	Turn the power on and set the clock correctly then set timer programming again.	41	Power failed	-
	Insert the recordable disc.	42	No disc when recording	-

Note: If a system error occurs, an error number appears on the screen.

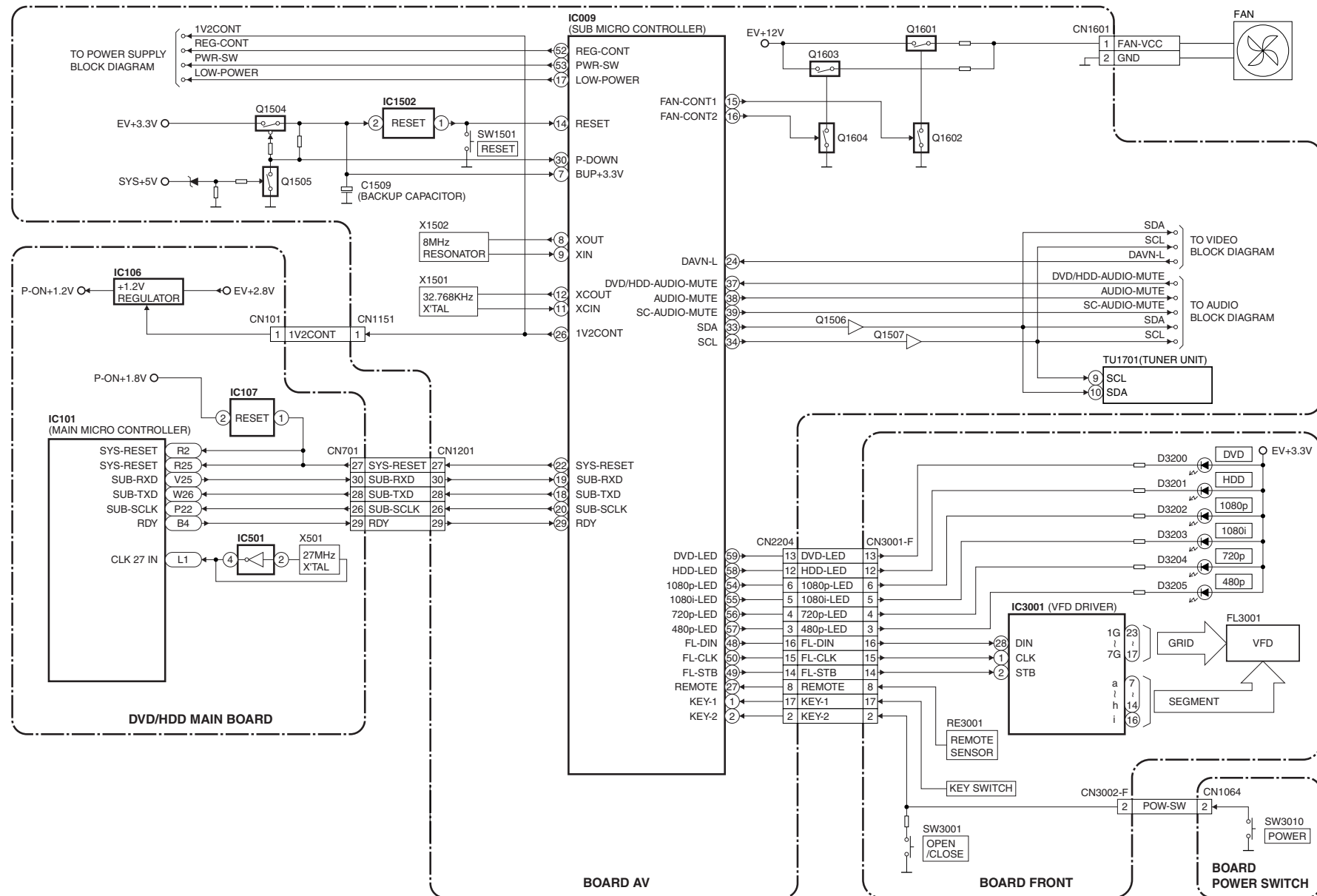


Error No.	Error Description	Process
1	Detection of HDD high temperature; This unit will turn off. (Stand-by) if this processing carry out. "SE 1" indication will flash in FL display when turning on. "SE 1" indication will be released by pressing any button. (It will not be displayed in OSD.)	Automatically turns off.
2	Detection of HDD hang up.	Press [POWER] button.

BLOCK DIAGRAMS

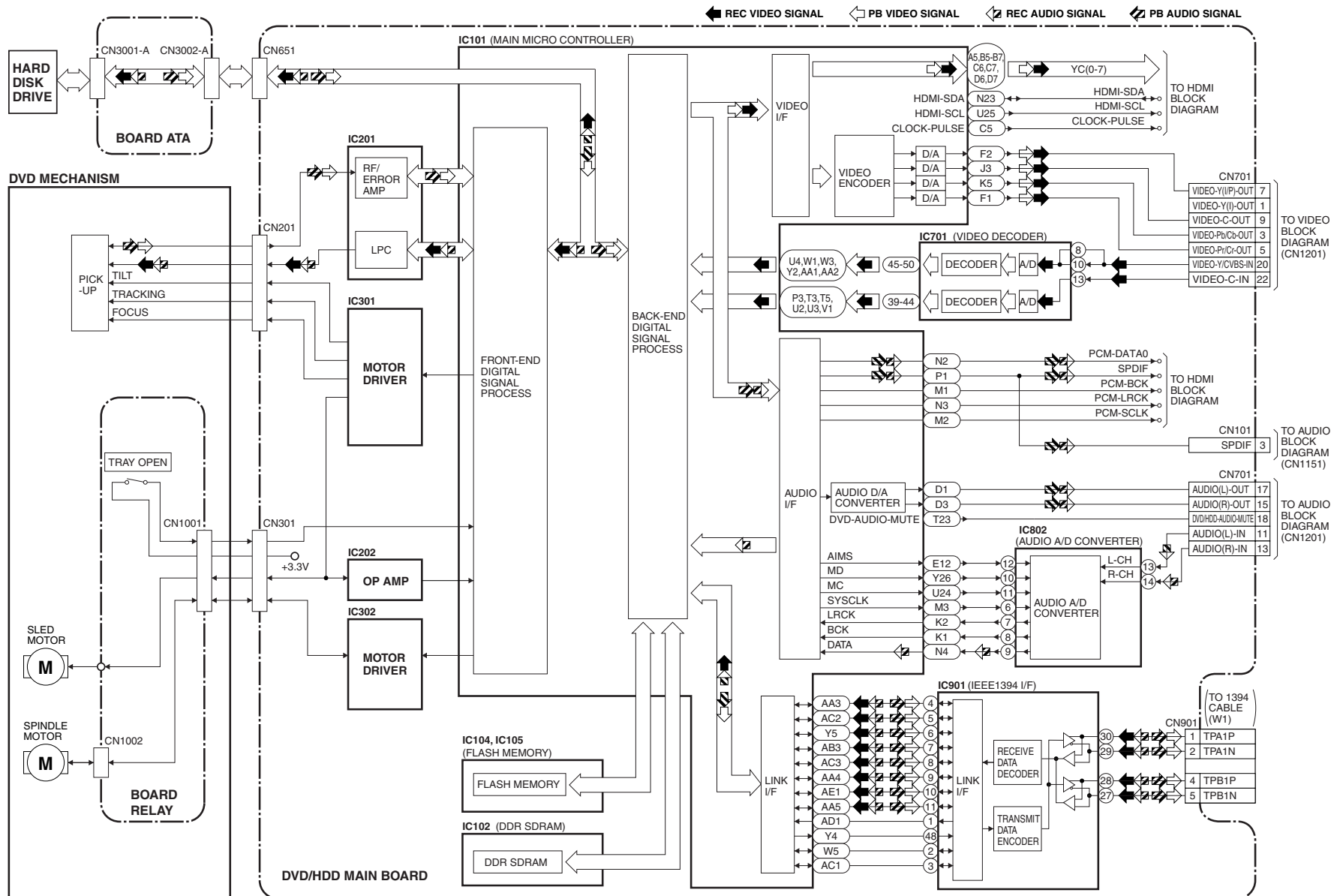
System Control Block Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



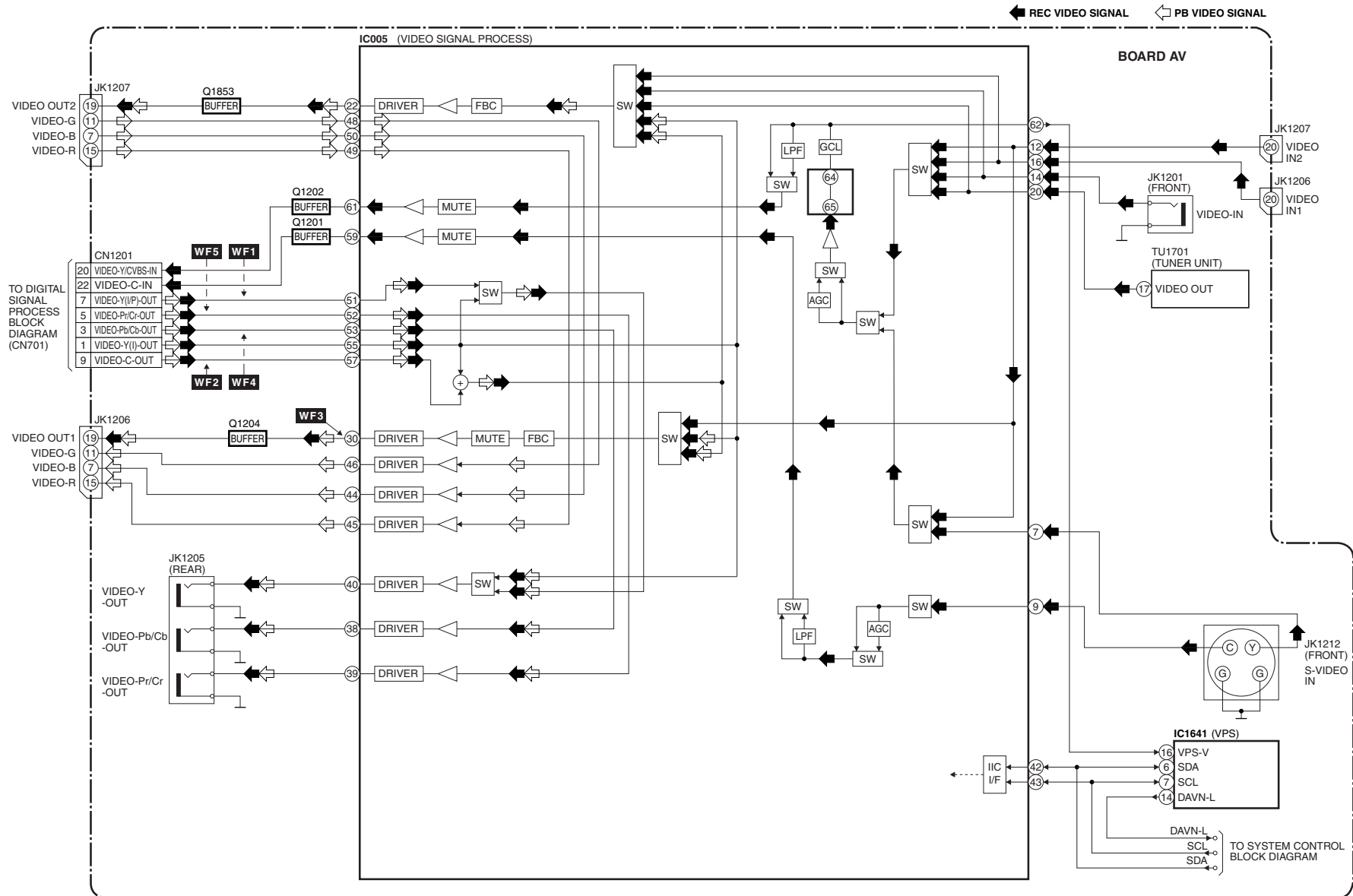
Digital Signal Process Block Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



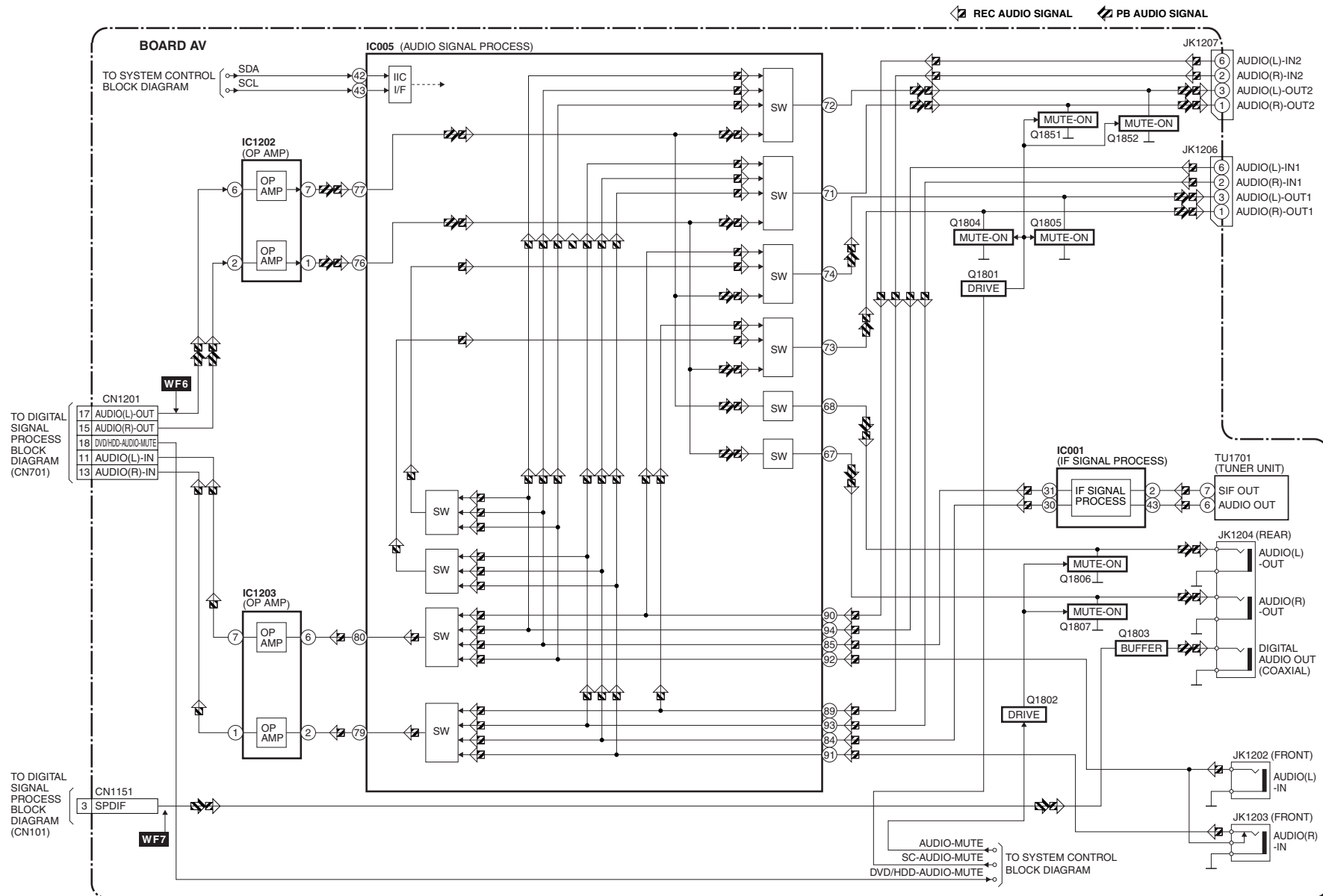
Video Block Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



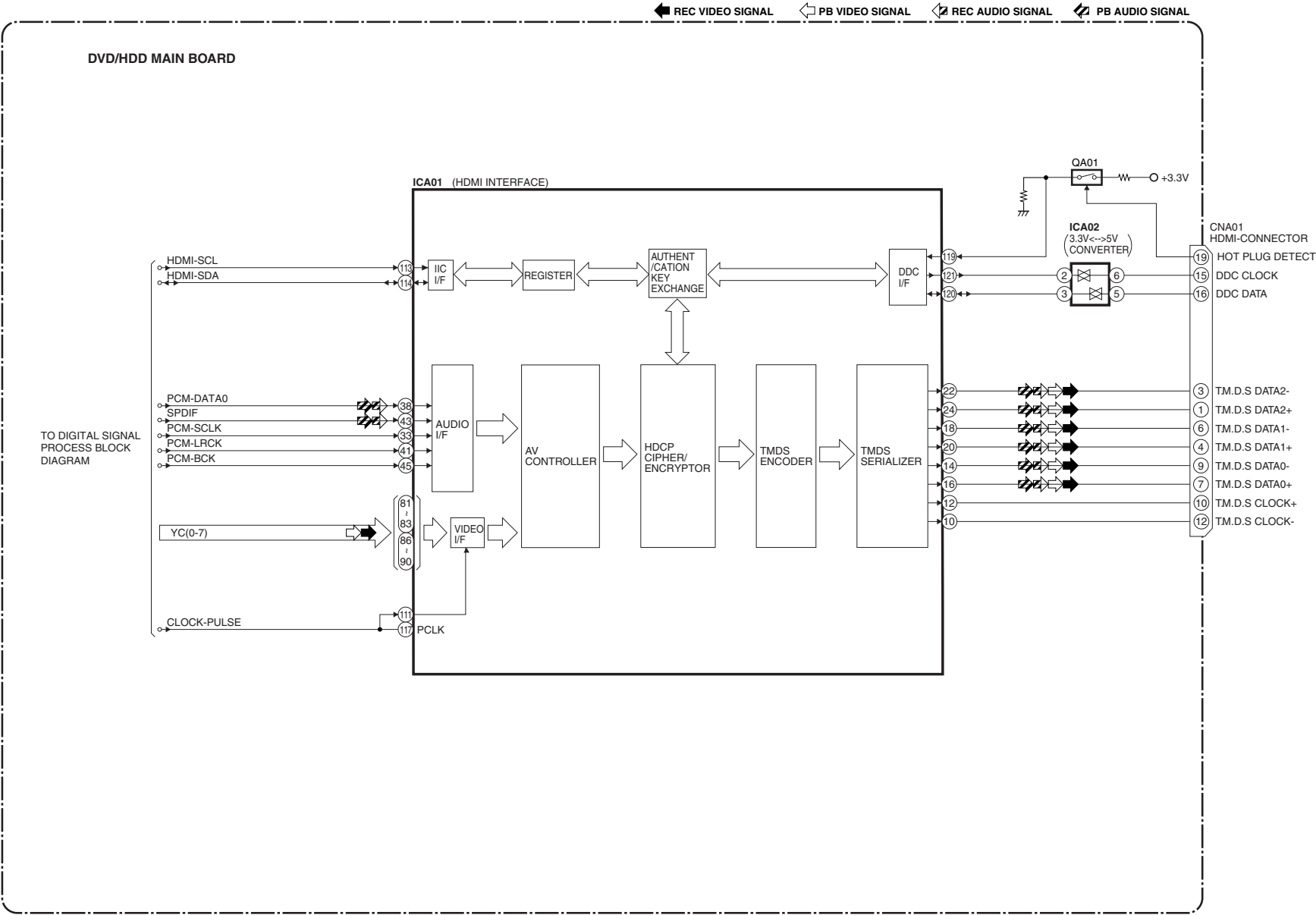
Audio Block Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



HDMI Block Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



Power Supply Block Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

CAUTION !

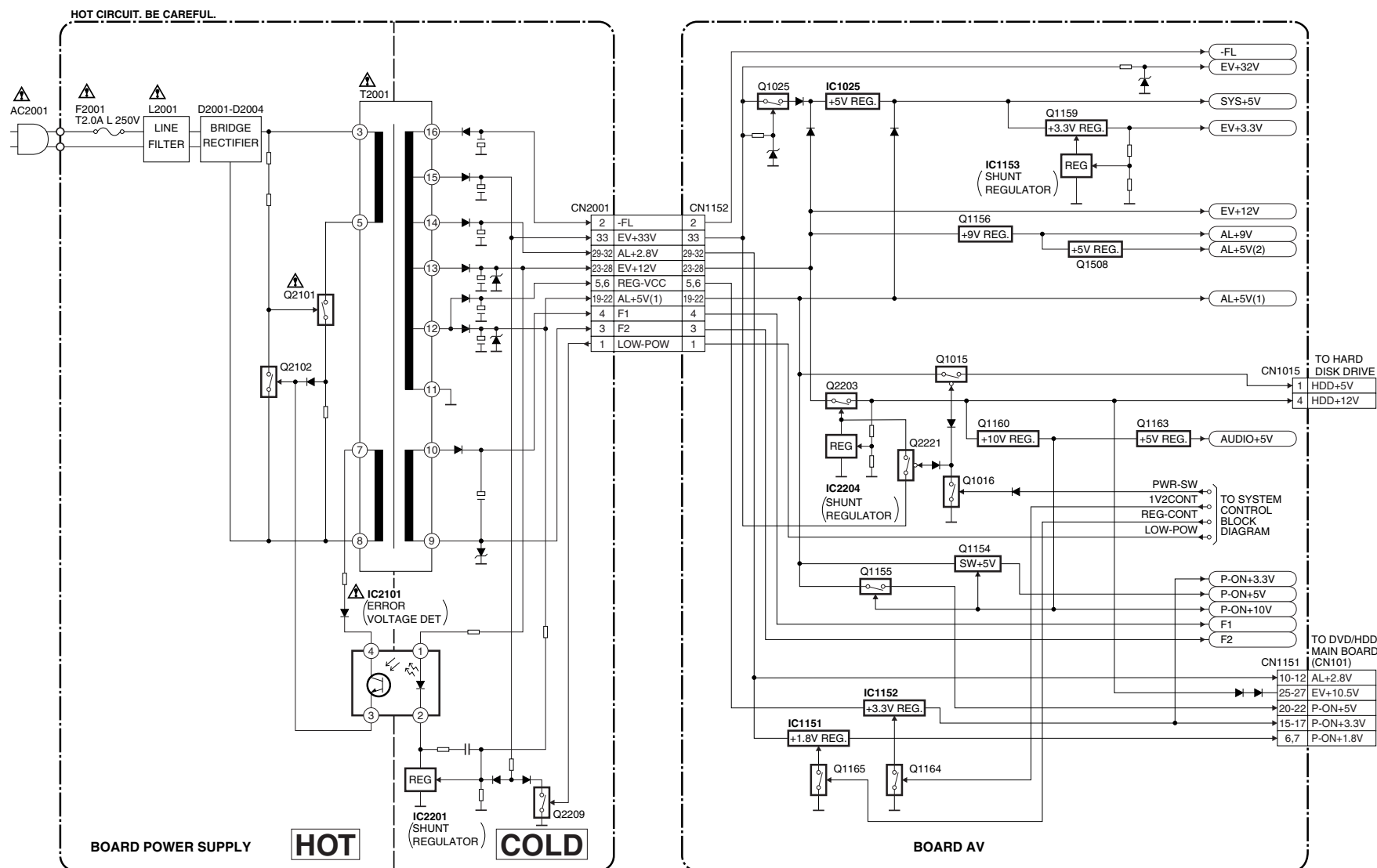
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F2001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

CAUTION !

For continued protection against fire hazard,
replace only with the same type fuse.

NOTE:

The voltage for parts in hot circuit is measured using hot GND as a common terminal.



SCHEMATIC DIAGRAMS / BOARD'S AND TEST POINTS

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

Standard Notes

WARNING

Many electrical and mechanical parts in this chassis have special characteristics. These characteristics often pass unnoticed and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts that have these special safety characteristics are identified in this manual and its supplements; electrical components having such features are identified by the mark " ⚠ " in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts that do not have the same safety characteristics as specified in the parts list may create shock, fire, or other hazards.

Notes:

1. Do not use the part number shown on these drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since these drawings were prepared.
2. All resistance values are indicated in ohms ($K=10^3$, $M=10^6$).
3. Resistor wattages are 1/4W or 1/6W unless otherwise specified.
4. All capacitance values are indicated in μF ($P=10^{-6} \mu F$).
5. All voltages are DC voltages unless otherwise specified.
6. Electrical parts such as capacitors, connectors, diodes, IC's, transistors, resistors, switches, and fuses are identified by four digits. The first two digits are not shown for each component. In each block of the diagram, there is a note such as shown below to indicate these abbreviated two digits.

LIST OF CAUTION, NOTES, AND SYMBOLS USED IN THE SCHEMATIC DIAGRAMS ON THE FOLLOWING PAGES:

1. CAUTION:

FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE.

2. CAUTION:

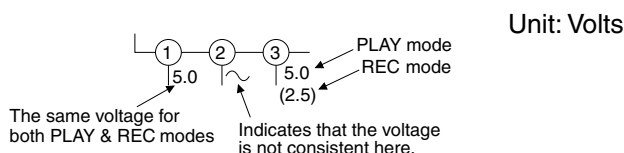
Fixed Voltage (or Auto voltage selectable) power supply circuit is used in this unit.

If Main Fuse (F2001) is blown, first check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

3. Note:

1. Do not use the part number shown on the drawings for ordering. The correct part number is shown in the parts list, and may be slightly different or amended since the drawings were prepared.
2. To maintain original function and reliability of repaired units, use only original replacement parts which are listed with their part numbers in the parts list section of the service manual.

4. Voltage indications for PLAY and REC modes on the schematics are as shown below:



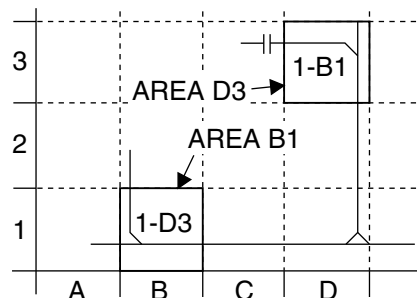
5. How to read converged lines

1-D3

 Distinction Area
 Line Number
 (1 to 3 digits)

Examples:

1. "1-D3" means that line number "1" goes to the line number "1" of the area "D3".
2. "1-B1" means that line number "1" goes to the line number "1" of the area "B1".



6. Test Point Information

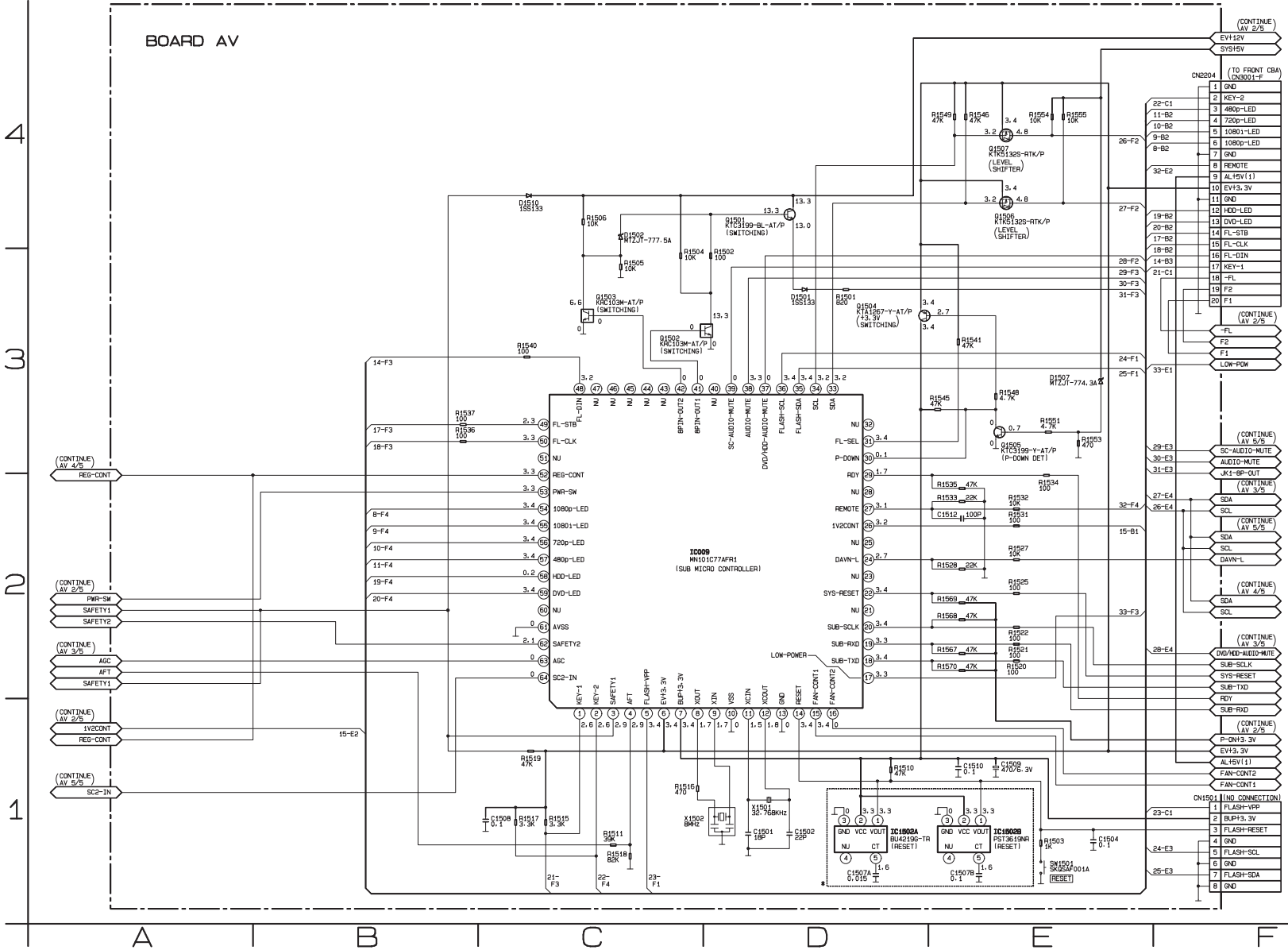
: Indicates a test point with a jumper wire across a hole in the PCB.

: Used to indicate a test point with a component lead on foil side.

: Used to indicate a test point with no test pin.

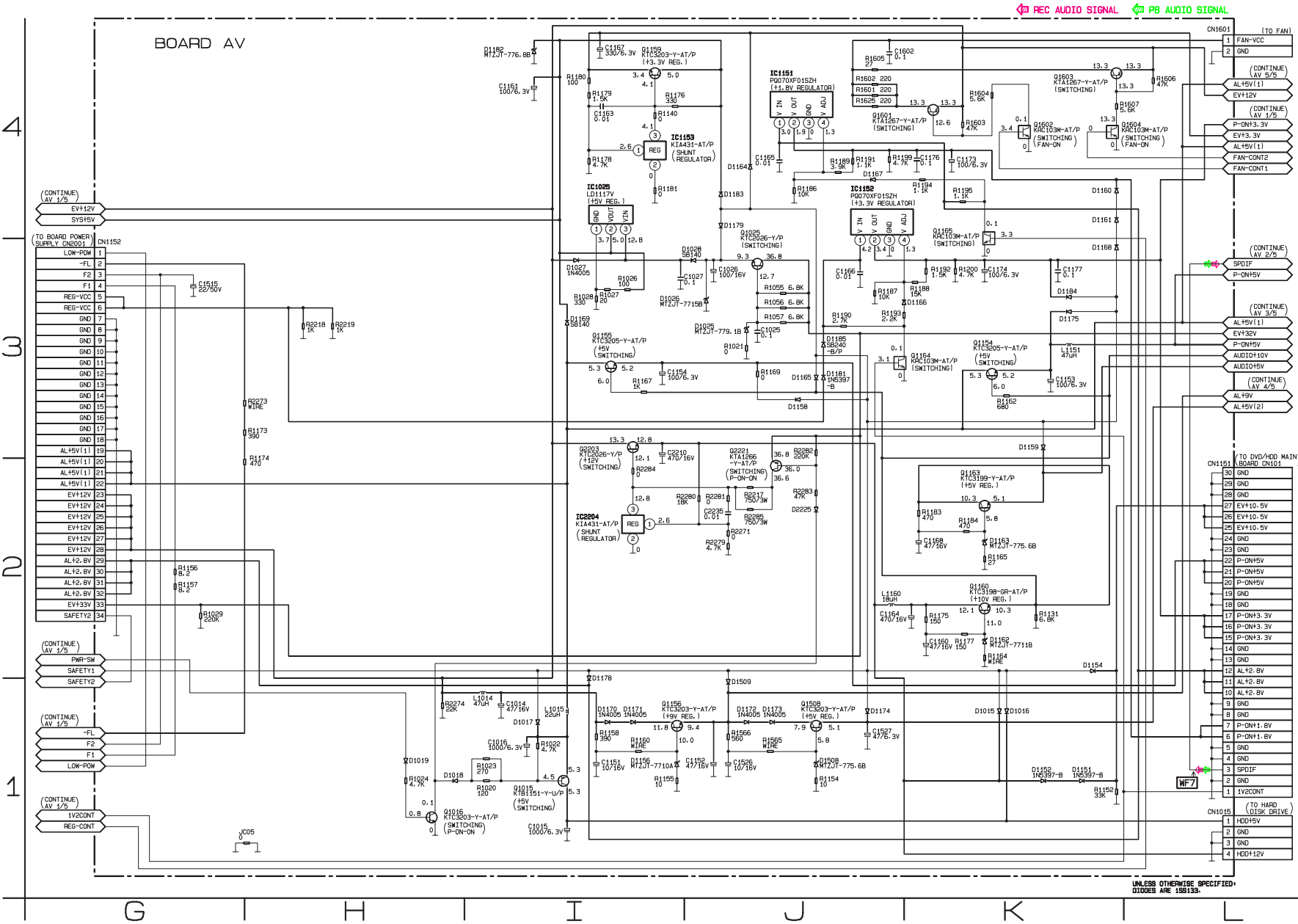
: Used to indicate a test point with a test pin.

AV 1/5 Schematic Diagram



AV 2/5 Schematic Diagram

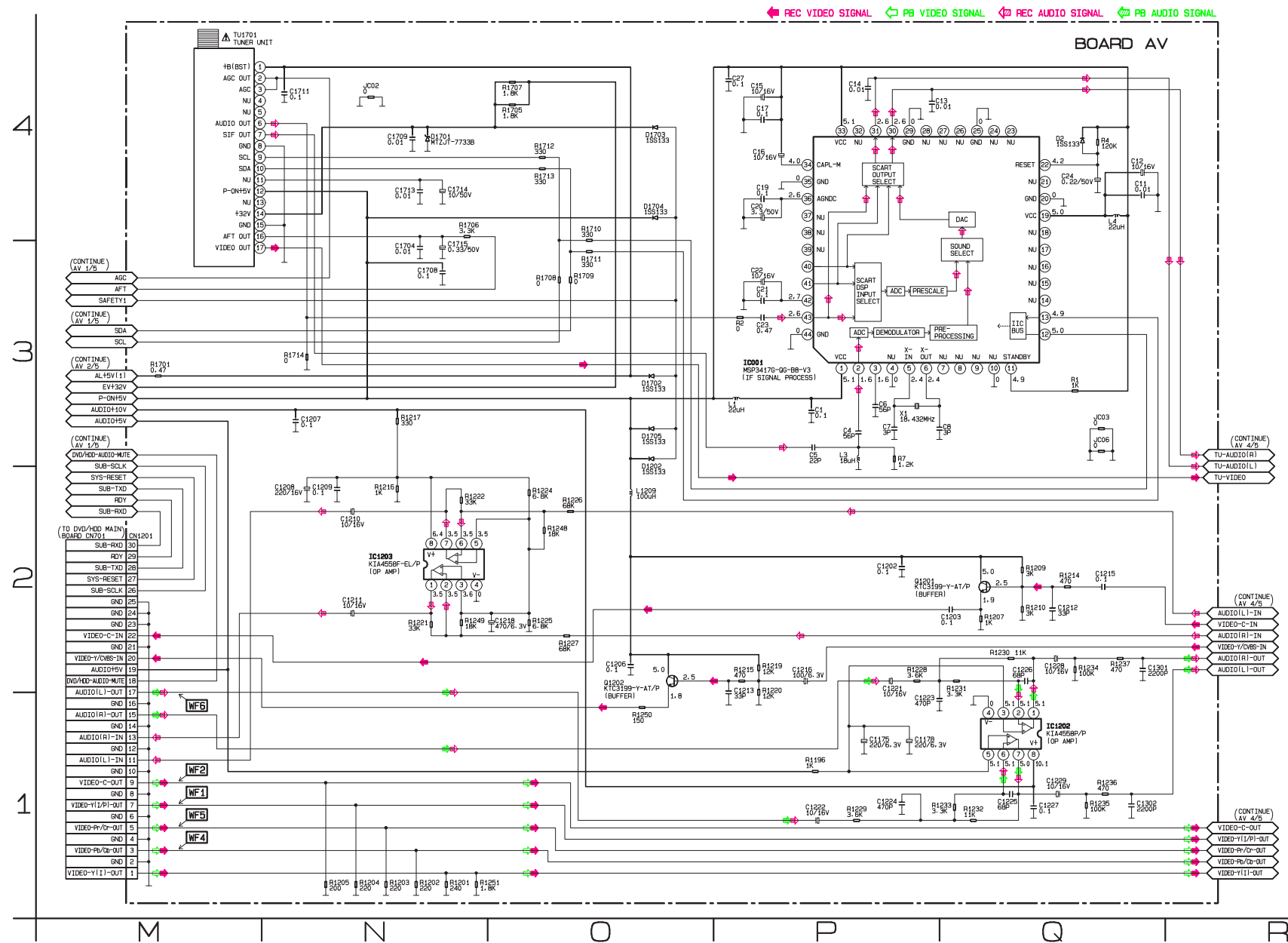
NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

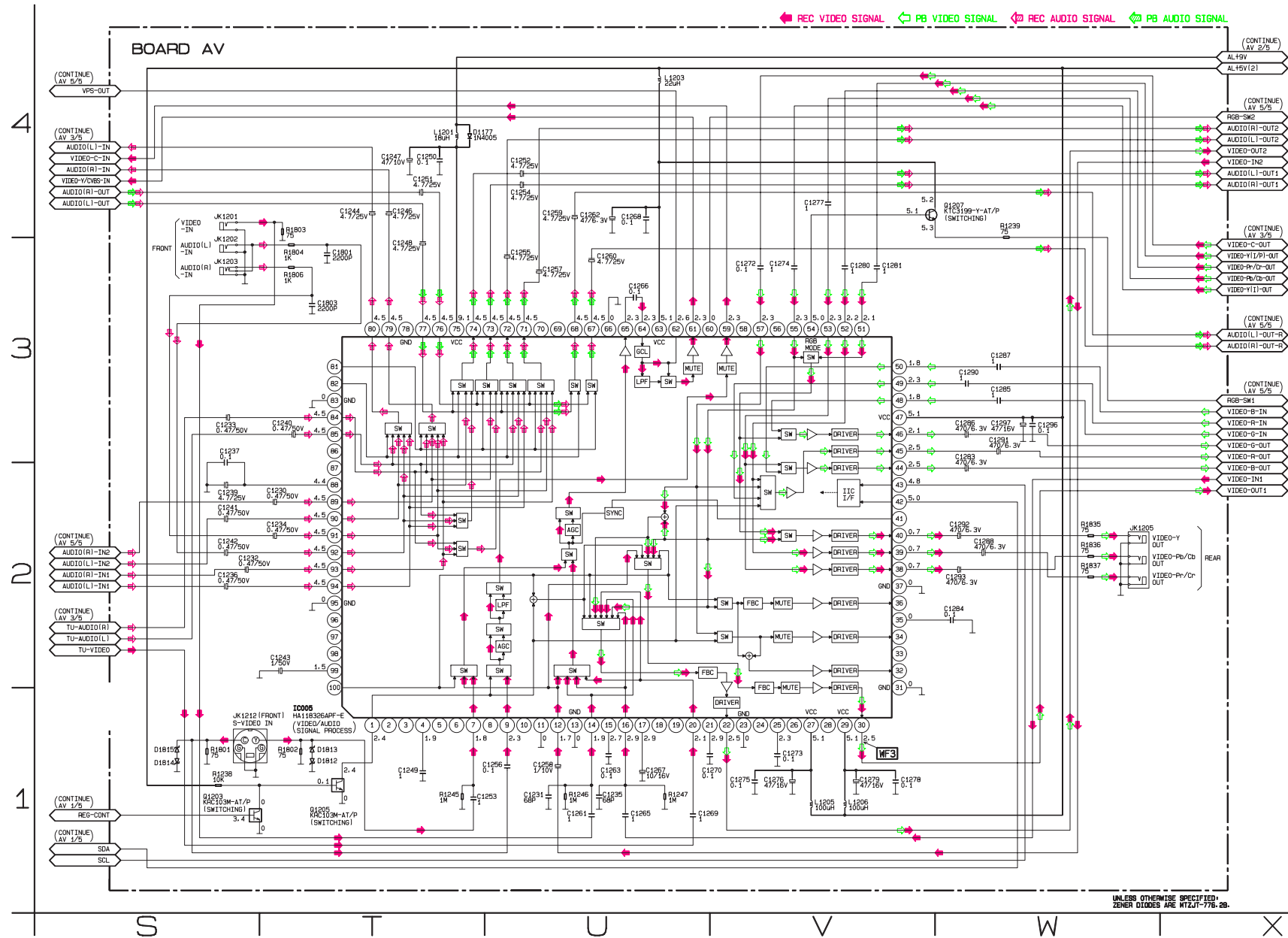
AV 3/5 Schematic Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



AV 4/5 Schematic Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



BOARD AV

CONNECTORS:

- AV 2/5 (CONTINUE): AL+5V(1), EV+12V
- AV 4/5 (CONTINUE): AUDIO(L)-OUT-R, AUDIO(R)-OUT-R
- AV 1/5 (CONTINUE): SC-AUDIO-MUTE, AUDIO-MUTE, JK1-BP-OUT
- SC2-IN (CONTINUE): SC2-IN
- RGB-SM1 (CONTINUE): VIDEO-B-IN, VIDEO-R-IN, VIDEO-G-IN, VIDEO-R-OUT, VIDEO-B-OUT, VIDEO-G-OUT, VIDEO-IN1, VIDEO-OUT1
- RGB-SM2 (CONTINUE): AUDIO(R)-OUT2, AUDIO(L)-OUT2, VIDEO-OUT2, VIDEO-IN2, AUDIO(L)-OUT1, AUDIO(R)-OUT1
- SDA (CONTINUE): SDA, SCL, DAVN-L
- VPS-OUT (CONTINUE): VPS-OUT
- AV 4/5 (CONTINUE): AUDIO(R)-IN2, AUDIO(L)-IN2, AUDIO(R)-IN1, AUDIO(L)-IN1

ICs:

- IC1641: LC747933N-TLM-E (VPS)
- IC1642: KIA1266-Y-AT/P (BUFFER)
- IC1643: KIA1266-Y-AT/P (A-MUTE)
- IC1644: KIA1266-Y-AT/P (A-MUTE)
- IC1645: KIA1266-Y-AT/P (A-MUTE)
- IC1646: KIA1266-Y-AT/P (A-MUTE)
- IC1647: KIA1266-Y-AT/P (A-MUTE)
- IC1648: KIA1266-Y-AT/P (A-MUTE)
- IC1649: KIA1266-Y-AT/P (A-MUTE)
- IC1650: KIA1266-Y-AT/P (A-MUTE)
- IC1651: KIA1266-Y-AT/P (A-MUTE)
- IC1652: KIA1266-Y-AT/P (A-MUTE)
- IC1653: KIA1266-Y-AT/P (A-MUTE)
- IC1654: KIA1266-Y-AT/P (A-MUTE)
- IC1655: KIA1266-Y-AT/P (A-MUTE)
- IC1656: KIA1266-Y-AT/P (A-MUTE)
- IC1657: KIA1266-Y-AT/P (A-MUTE)
- IC1658: KIA1266-Y-AT/P (A-MUTE)
- IC1659: KIA1266-Y-AT/P (A-MUTE)
- IC1660: KIA1266-Y-AT/P (A-MUTE)
- IC1661: KIA1266-Y-AT/P (A-MUTE)
- IC1662: KIA1266-Y-AT/P (A-MUTE)
- IC1663: KIA1266-Y-AT/P (A-MUTE)
- IC1664: KIA1266-Y-AT/P (A-MUTE)
- IC1665: KIA1266-Y-AT/P (A-MUTE)
- IC1666: KIA1266-Y-AT/P (A-MUTE)
- IC1667: KIA1266-Y-AT/P (A-MUTE)
- IC1668: KIA1266-Y-AT/P (A-MUTE)
- IC1669: KIA1266-Y-AT/P (A-MUTE)
- IC1670: KIA1266-Y-AT/P (A-MUTE)
- IC1671: KIA1266-Y-AT/P (A-MUTE)
- IC1672: KIA1266-Y-AT/P (A-MUTE)
- IC1673: KIA1266-Y-AT/P (A-MUTE)
- IC1674: KIA1266-Y-AT/P (A-MUTE)
- IC1675: KIA1266-Y-AT/P (A-MUTE)
- IC1676: KIA1266-Y-AT/P (A-MUTE)
- IC1677: KIA1266-Y-AT/P (A-MUTE)
- IC1678: KIA1266-Y-AT/P (A-MUTE)
- IC1679: KIA1266-Y-AT/P (A-MUTE)
- IC1680: KIA1266-Y-AT/P (A-MUTE)
- IC1681: KIA1266-Y-AT/P (A-MUTE)
- IC1682: KIA1266-Y-AT/P (A-MUTE)
- IC1683: KIA1266-Y-AT/P (A-MUTE)
- IC1684: KIA1266-Y-AT/P (A-MUTE)
- IC1685: KIA1266-Y-AT/P (A-MUTE)
- IC1686: KIA1266-Y-AT/P (A-MUTE)
- IC1687: KIA1266-Y-AT/P (A-MUTE)
- IC1688: KIA1266-Y-AT/P (A-MUTE)
- IC1689: KIA1266-Y-AT/P (A-MUTE)
- IC1690: KIA1266-Y-AT/P (A-MUTE)
- IC1691: KIA1266-Y-AT/P (A-MUTE)
- IC1692: KIA1266-Y-AT/P (A-MUTE)
- IC1693: KIA1266-Y-AT/P (A-MUTE)
- IC1694: KIA1266-Y-AT/P (A-MUTE)
- IC1695: KIA1266-Y-AT/P (A-MUTE)
- IC1696: KIA1266-Y-AT/P (A-MUTE)
- IC1697: KIA1266-Y-AT/P (A-MUTE)
- IC1698: KIA1266-Y-AT/P (A-MUTE)
- IC1699: KIA1266-Y-AT/P (A-MUTE)
- IC1700: KIA1266-Y-AT/P (A-MUTE)

Passive Components:

- Resistors: R1801, R1802, R1803, R1804, R1805, R1806, R1807, R1808, R1809, R1810, R1811, R1812, R1813, R1814, R1815, R1816, R1817, R1818, R1819, R1820, R1821, R1822, R1823, R1824, R1825, R1826, R1827, R1828, R1829, R1830, R1831, R1832, R1833, R1834, R1835, R1836, R1837, R1838, R1839, R1840, R1841, R1842, R1843, R1844, R1845, R1846, R1847, R1848, R1849, R1850, R1851, R1852, R1853, R1854, R1855, R1856, R1857, R1858, R1859, R1860, R1861, R1862, R1863, R1864, R1865, R1866, R1867, R1868, R1869, R1870, R1871, R1872, R1873, R1874, R1875, R1876, R1877, R1878, R1879, R1880, R1881, R1882, R1883, R1884, R1885, R1886, R1887, R1888, R1889, R1890, R1891, R1892, R1893, R1894, R1895, R1896, R1897, R1898, R1899, R1900, R1901, R1902, R1903, R1904, R1905, R1906, R1907, R1908, R1909, R1910, R1911, R1912, R1913, R1914, R1915, R1916, R1917, R1918, R1919, R1920, R1921, R1922, R1923, R1924, R1925, R1926, R1927, R1928, R1929, R1930, R1931, R1932, R1933, R1934, R1935, R1936, R1937, R1938, R1939, R1940, R1941, R1942, R1943, R1944, R1945, R1946, R1947, R1948, R1949, R1950, R1951, R1952, R1953, R1954, R1955, R1956, R1957, R1958, R1959, R1960, R1961, R1962, R1963, R1964, R1965, R1966, R1967, R1968, R1969, R1970, R1971, R1972, R1973, R1974, R1975, R1976, R1977, R1978, R1979, R1980, R1981, R1982, R1983, R1984, R1985, R1986, R1987, R1988, R1989, R1990, R1991, R1992, R1993, R1994, R1995, R1996, R1997, R1998, R1999, R2000.
- Capacitors: C1801, C1802, C1803, C1804, C1805, C1806, C1807, C1808, C1809, C1810, C1811, C1812, C1813, C1814, C1815, C1816, C1817, C1818, C1819, C1820, C1821, C1822, C1823, C1824, C1825, C1826, C1827, C1828, C1829, C1830, C1831, C1832, C1833, C1834, C1835, C1836, C1837, C1838, C1839, C1840, C1841, C1842, C1843, C1844, C1845, C1846, C1847, C1848, C1849, C1850, C1851, C1852, C1853, C1854, C1855, C1856, C1857, C1858, C1859, C1860, C1861, C1862, C1863, C1864, C1865, C1866, C1867, C1868, C1869, C1870, C1871, C1872, C1873, C1874, C1875, C1876, C1877, C1878, C1879, C1880, C1881, C1882, C1883, C1884, C1885, C1886, C1887, C1888, C1889, C1890, C1891, C1892, C1893, C1894, C1895, C1896, C1897, C1898, C1899, C1900, C1901, C1902, C1903, C1904, C1905, C1906, C1907, C1908, C1909, C1910, C1911, C1912, C1913, C1914, C1915, C1916, C1917, C1918, C1919, C1920, C1921, C1922, C1923, C1924, C1925, C1926, C1927, C1928, C1929, C1930, C1931, C1932, C1933, C1934, C1935, C1936, C1937, C1938, C1939, C1940, C1941, C1942, C1943, C1944, C1945, C1946, C1947, C1948, C19

UNLESS OTHERWISE SPECIFIED:
ZENER DIODES ARE MTZJT-7711A.

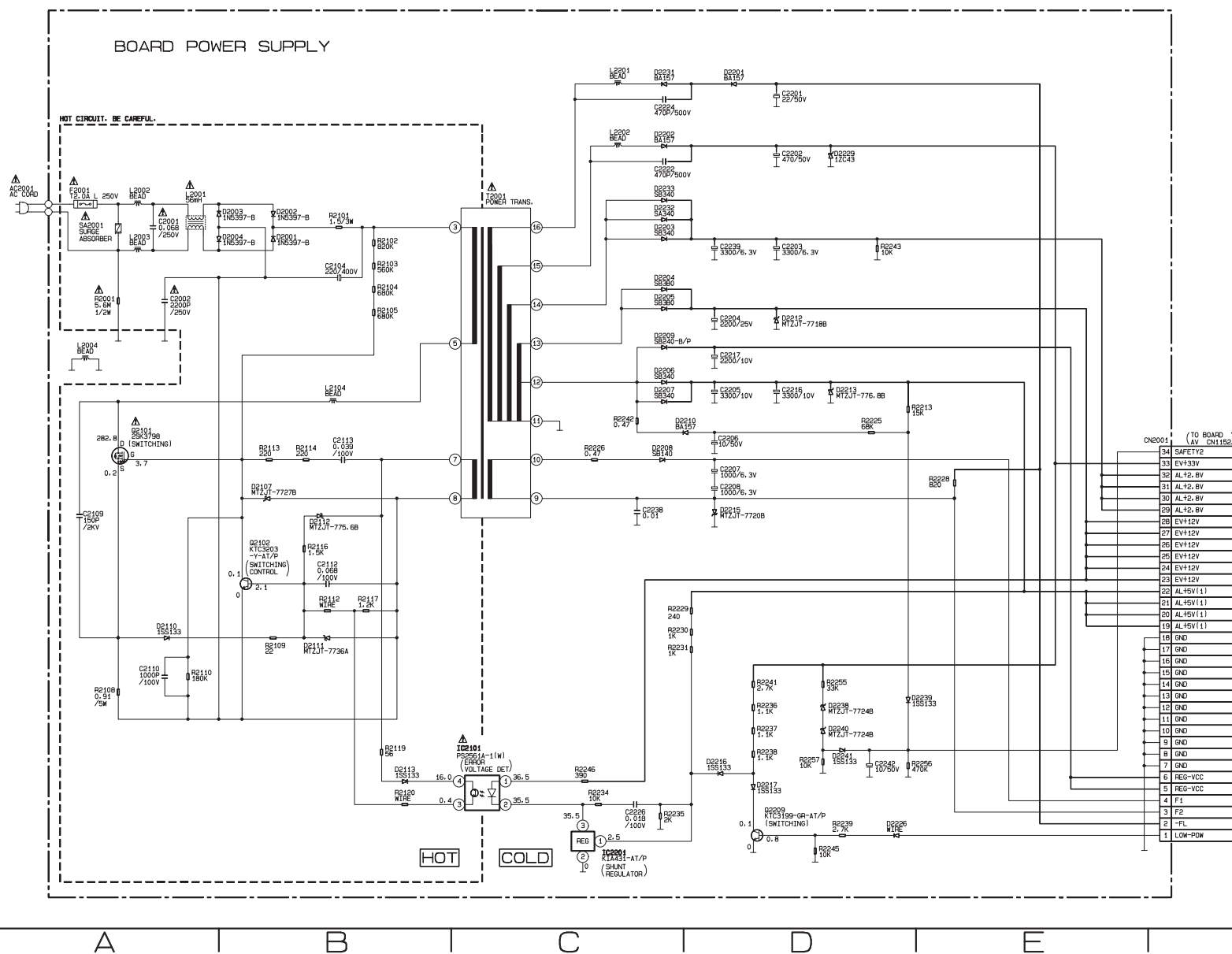
A vertical axis with tick marks labeled 1, 2, 3, and 4.

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F2001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

CAUTION:
For continued protection against fire hazard,
replace only with the same type fuse.

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

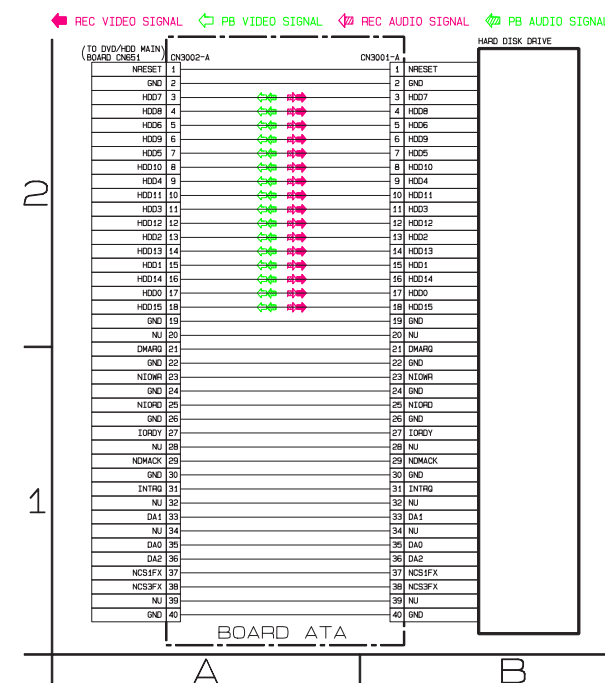
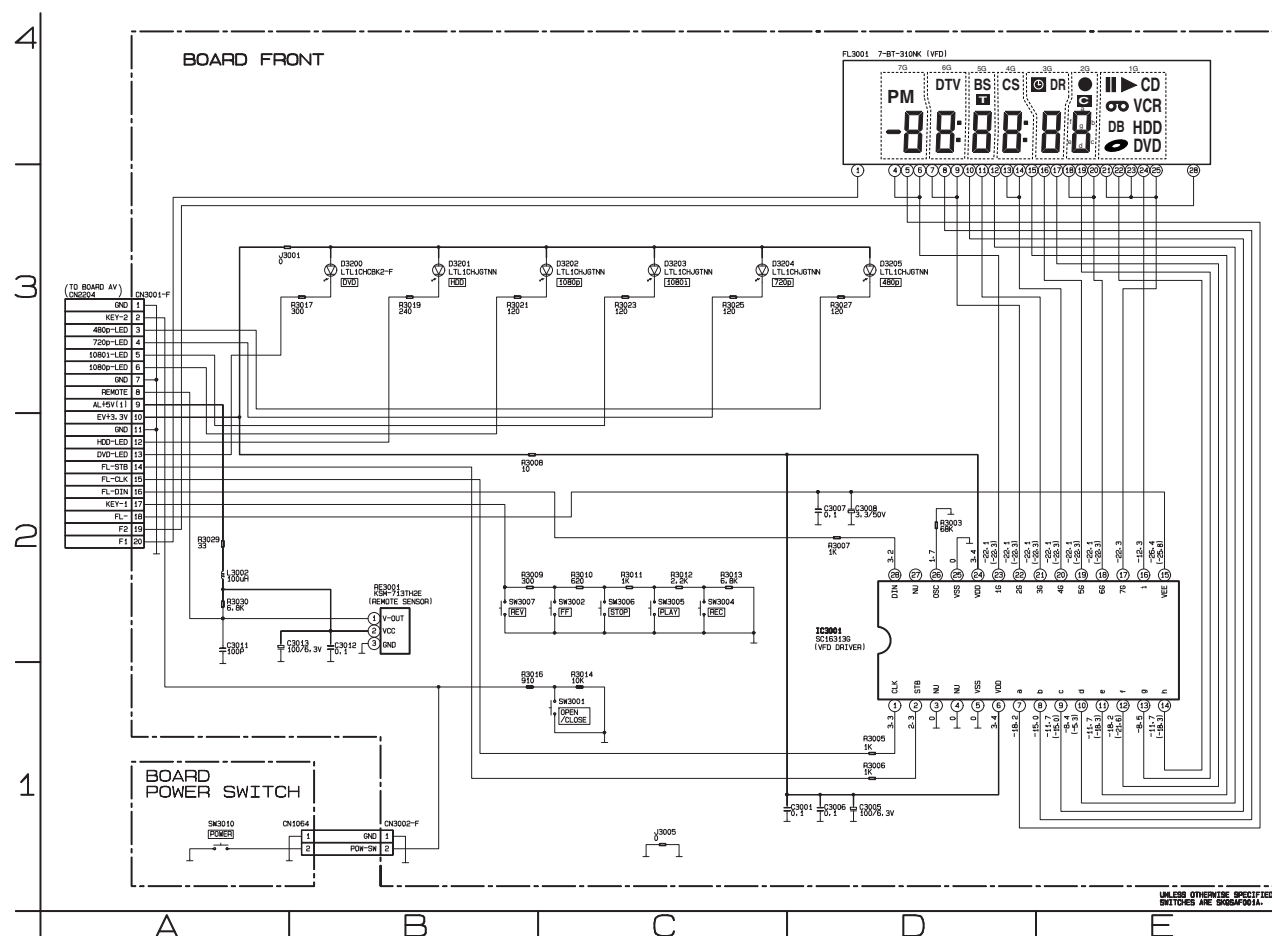
NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

ATA Schematic Diagram

FL3001 MATRIX CHART							
	7G	6G	5G	4G	3G	2G	1G
P1	a	a	a	a	a	a	CD
P2	b	b	b	b	b	b	OC
P3	f	f	f	f	f	f	VCD
P4	g	g	g	g	g	g	DB
P5	c	c	c	c	c	c	HD
P6	e	e	e	e	e	e	DV
P7	d	d	d	d	d	d	
P8	S1	T	CS	DR	C		
P9	PM	DTV	BS	CS	DR	C	



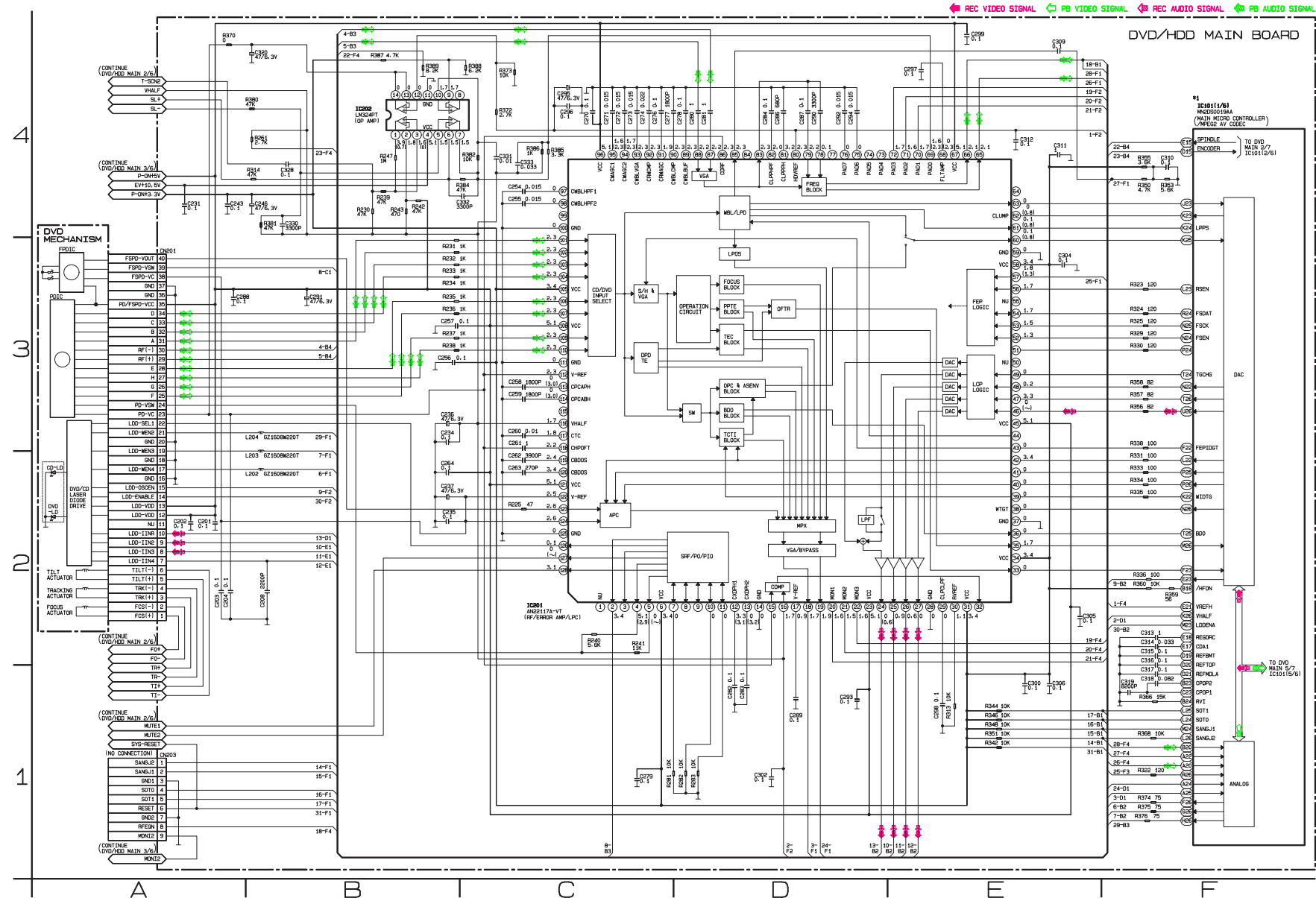
DVD/HDD MAIN 1/6 Schematic Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

*1 NOTE:

The order of pins shown in this diagram is different from that of actual IC101.

IC101 is divided into six and shown as IC101 (1/6) - IC101 (6/6) in this DVD/HDD Main Schematic Diagram Section.

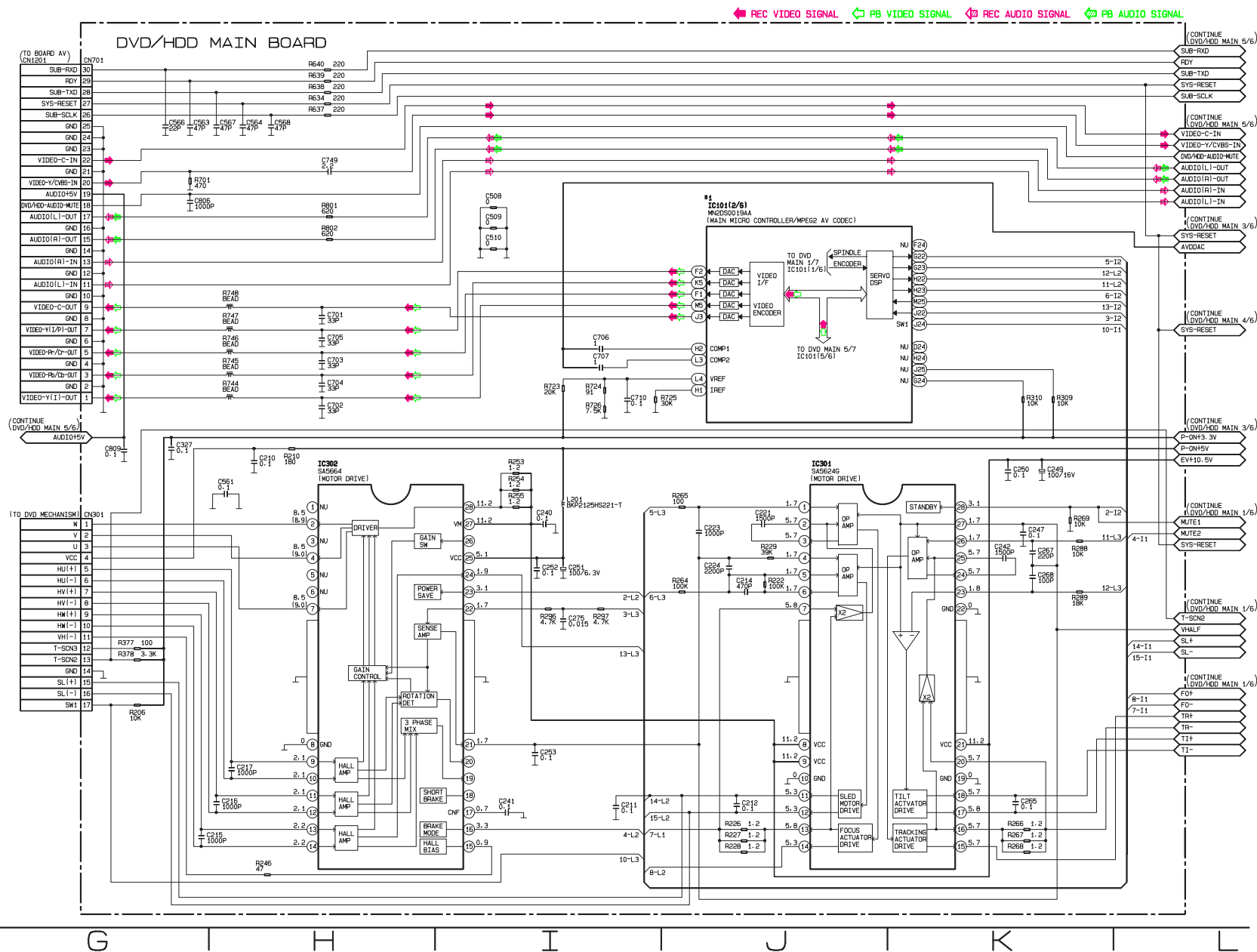


4
—
3
—
2
—
1

The order of pins shown in this diagram is different from that of actual IC101.

10101 is divided into six and shown as 10101 (1/3) - 10101 (5/5) in this DVD/HD Main Schematic Diagram Section.

(CONTINUED)
(DVD/HDD MAIN 5/6)



4

3

2

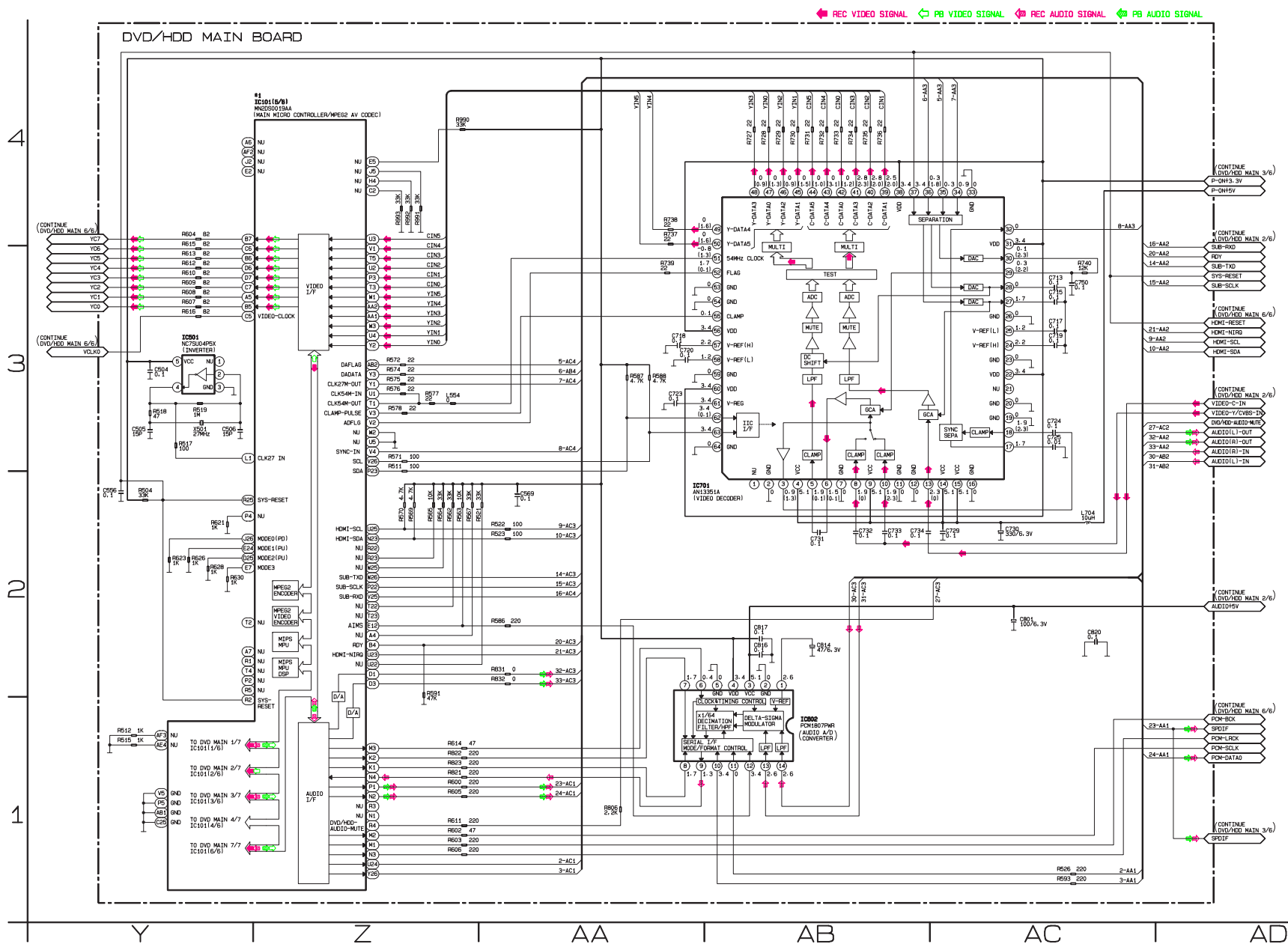
1

4
3
2
1

***1 NOTE:**

The order of pins shown in this diagram is different from that of actual IC101.
IC101 is divided into six and shown as IC101 (1/6) ~ IC101 (6/6) in this DVD/HDD Main Schematic Diagram Section.

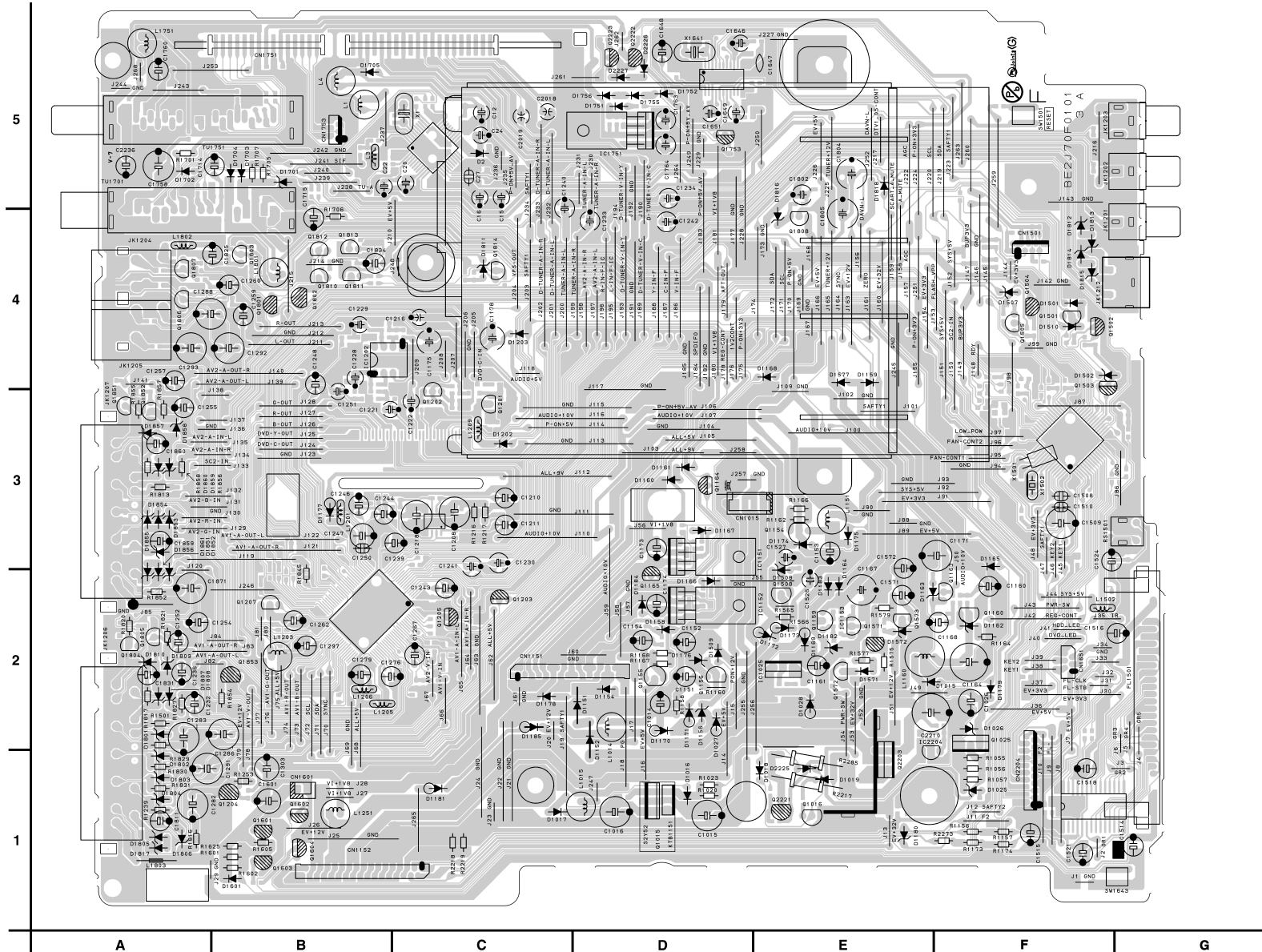
NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



SIGNAL PB AUDIO SIGNAL

BOARD AV Top View

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



BOARD AV Bottom View

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

WF7
PIN 3 OF
CN1151

WF3
PIN 30 OF
IC005

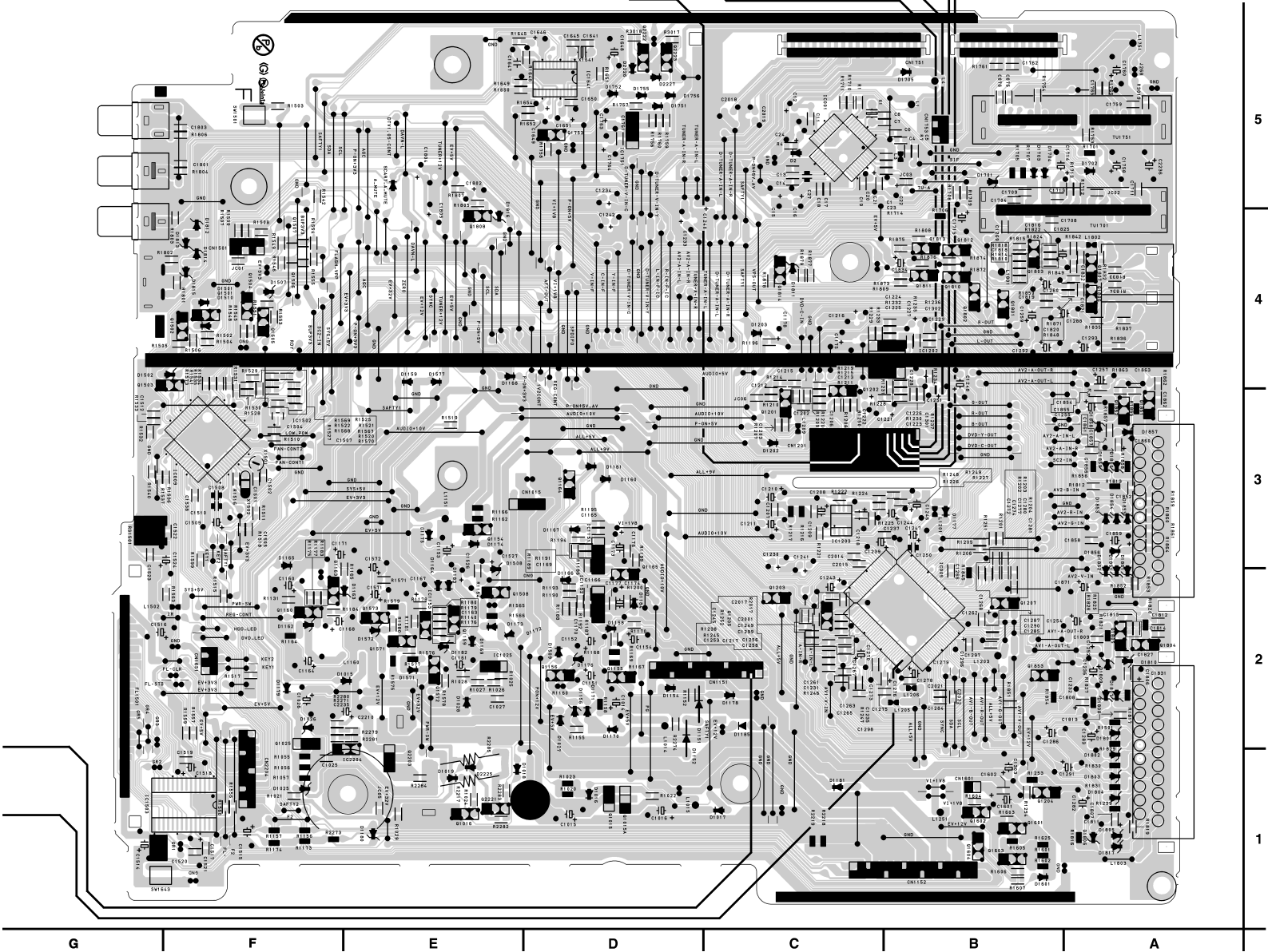
WF6
PIN 17 OF
CN1201

WF2
PIN 9 OF
CN1201

WF1
PIN 7 OF
CN1201

WF5
PIN 5 OF
CN1201

WF4
PIN 3 OF
CN1201



BOARD POWER SUPPLY Top View

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

CAUTION !

For continued protection against fire hazard,
replace only with the same type fuse.

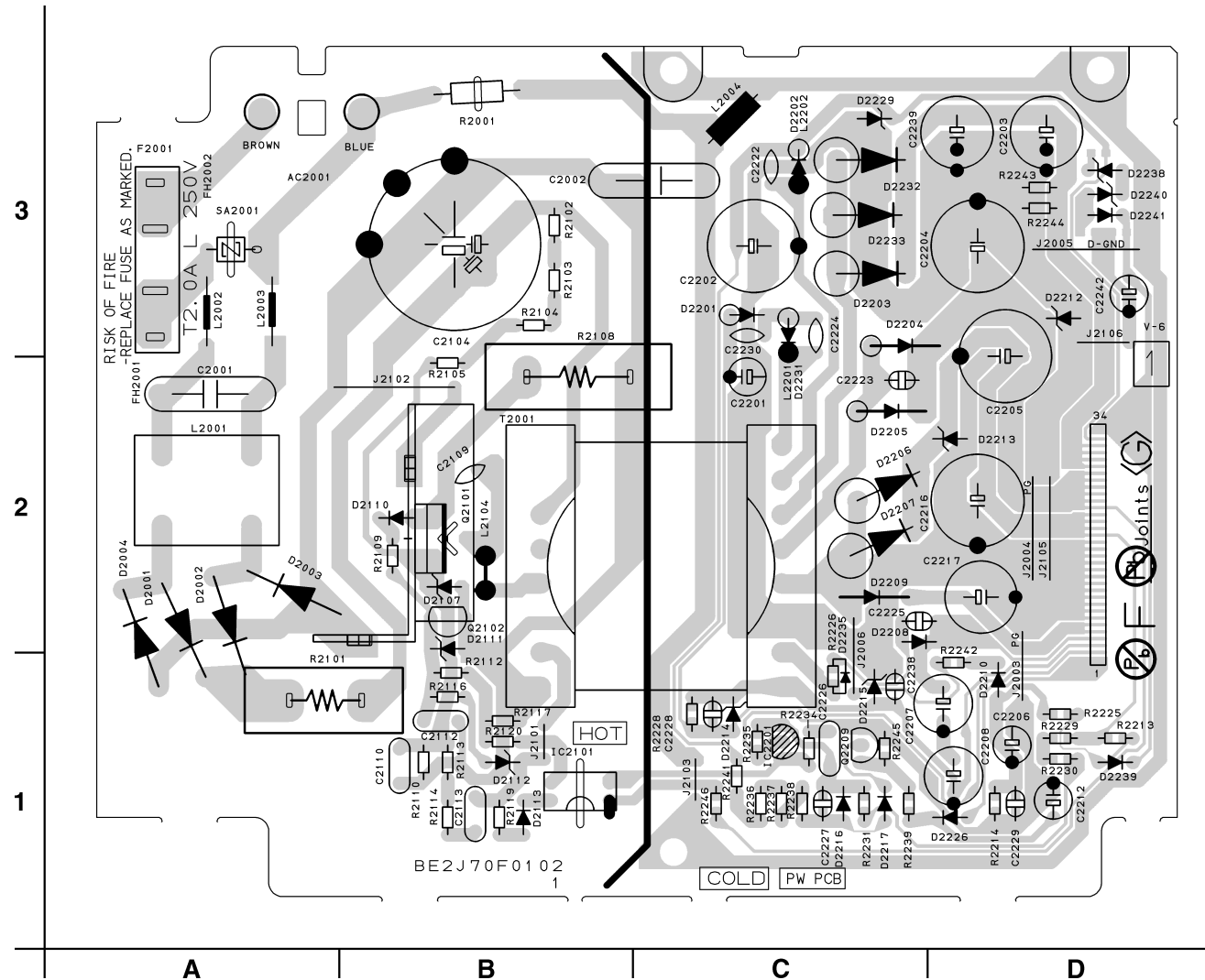
NOTE:

The voltage for parts in hot circuit is measured using hot GND as a common terminal.

CAUTION !

Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit. If Main Fuse (F2001) is blown, check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply. Otherwise it may cause some components in the power supply circuit to fail.

Because a not chassis ground is present in the power supply circuit, an isolation transformer must be used. Also, in order to have the ability to increase the input slowly, when troubleshooting this type power supply circuit, a variable isolation transformer is required.



BOARD POWER SUPPLY Bottom View

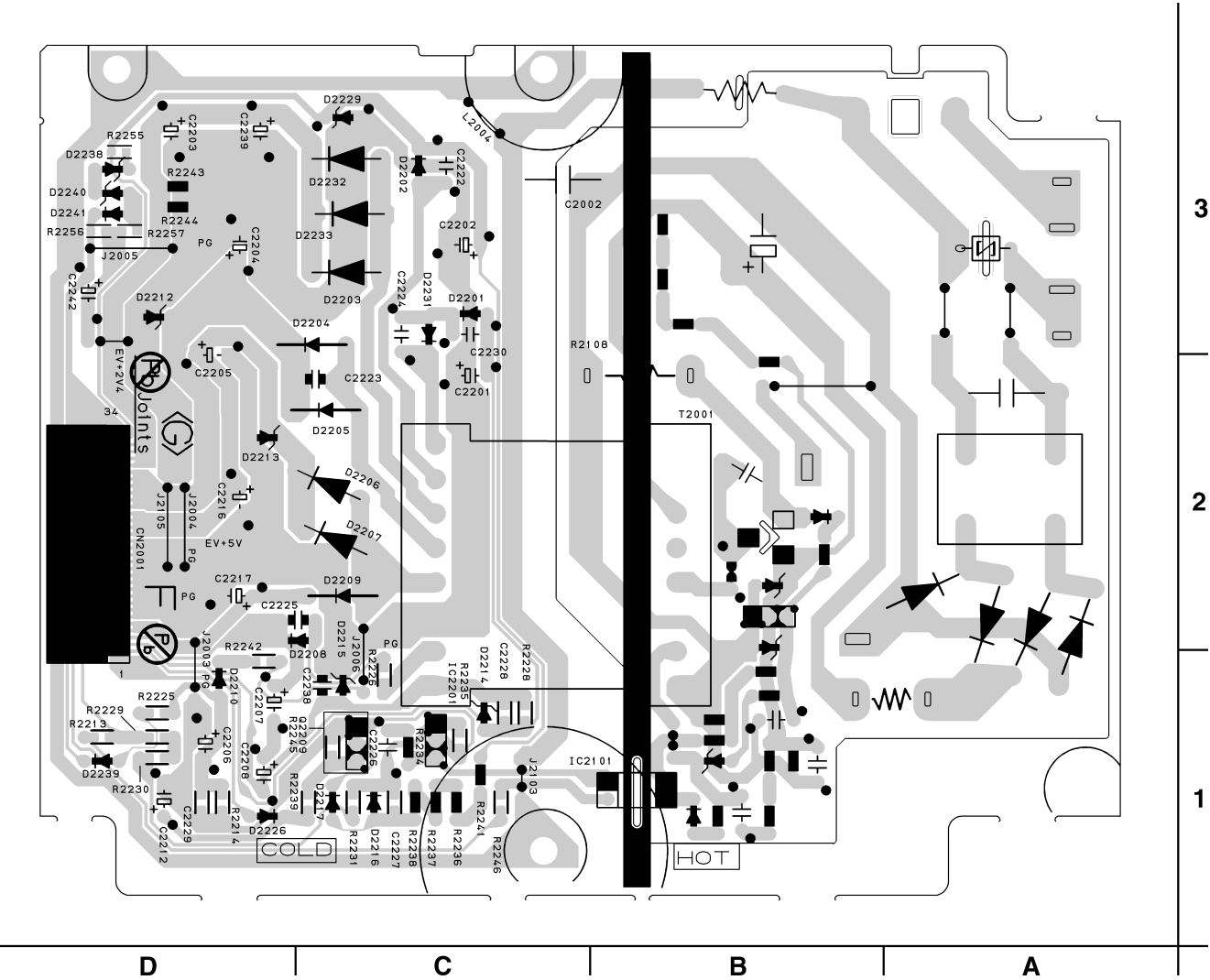
NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

CAUTION !
For continued protection against fire hazard, replace only with the same type fuse.

NOTE:
The voltage for parts in hot circuit is measured using hot GND as a common terminal.

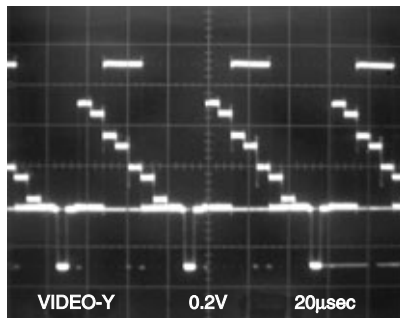
CAUTION !
Fixed voltage (or Auto voltage selectable) power supply circuit is used in this unit.
If Main Fuse (F2001) is blown , check to see that all components in the power supply circuit are not defective before you connect the AC plug to the AC power supply.
Otherwise it may cause some components in the power supply circuit to fail.

Because a hot chassis ground is present in the power supply circuit, an isolation transformer must be used.
Also, in order to have the ability to increase the input slowly, when troubleshooting this type power supply circuit, a variable isolation transformer is required.

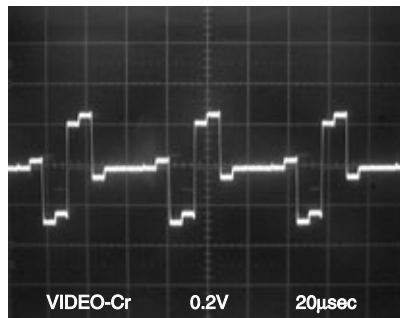


WAVEFORMS

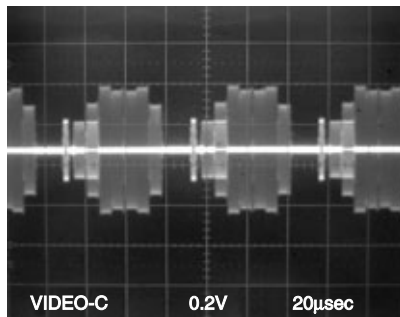
WF1 Pin 7 of CN1201



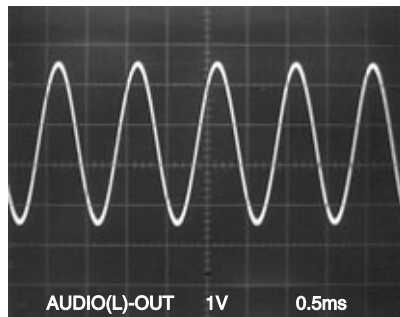
WF5 Pin 5 of CN1201



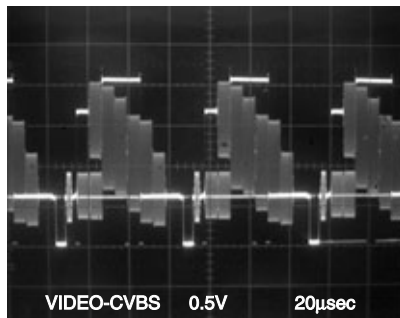
WF2 Pin 9 of CN1201



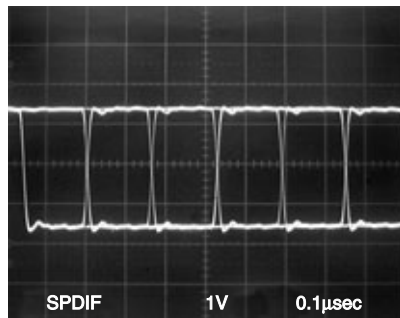
WF6 Pin 17 of CN1201



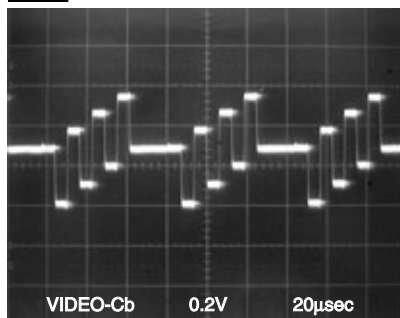
WF3 Pin 30 of IC005



WF7 Pin 3 of CN1151



WF4 Pin 3 of CN1201



NOTE:

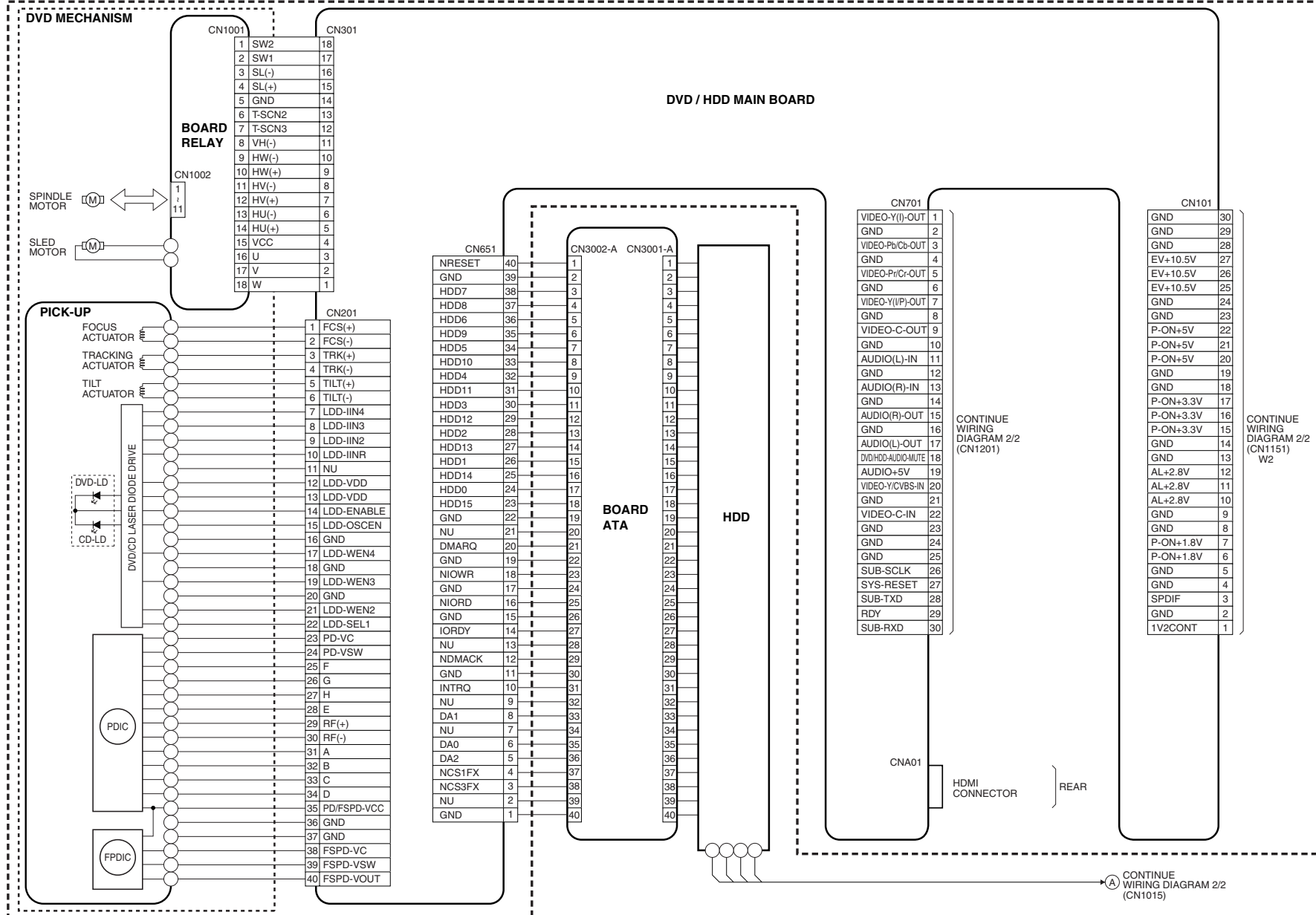
Input: COLOR BAR SIGNAL
(WITH 1KHz AUDIO SIGNAL)

WIRING DIAGRAM

Wiring 1/2 Diagram

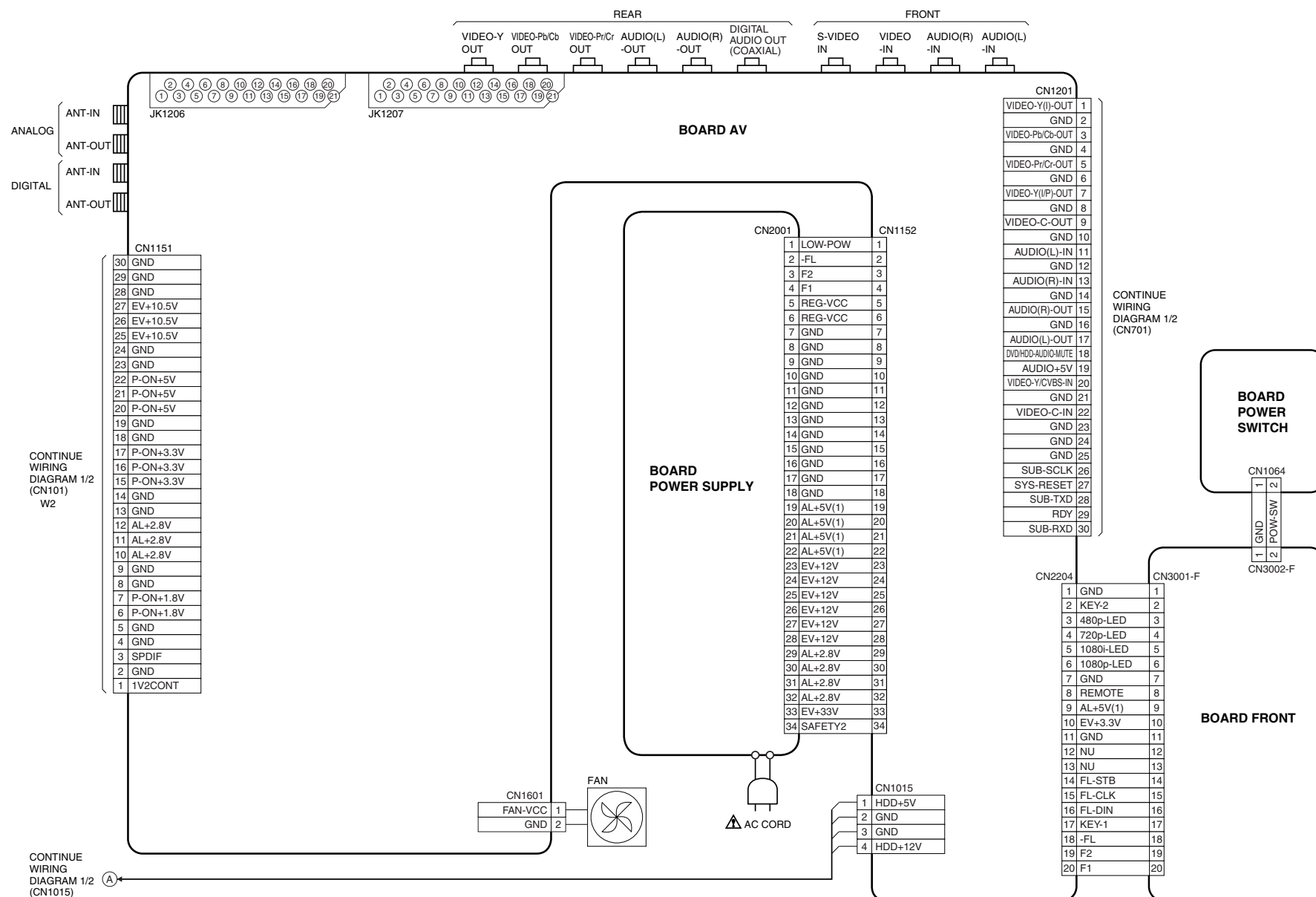
NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.

DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY

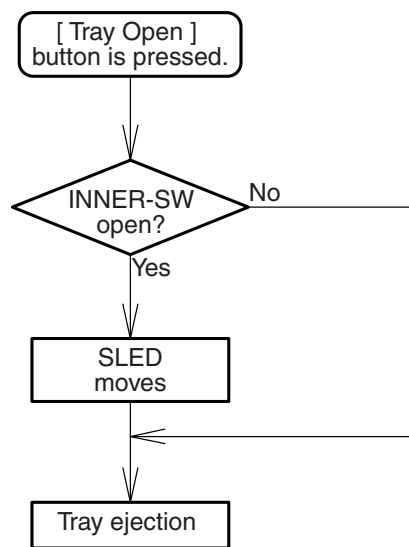
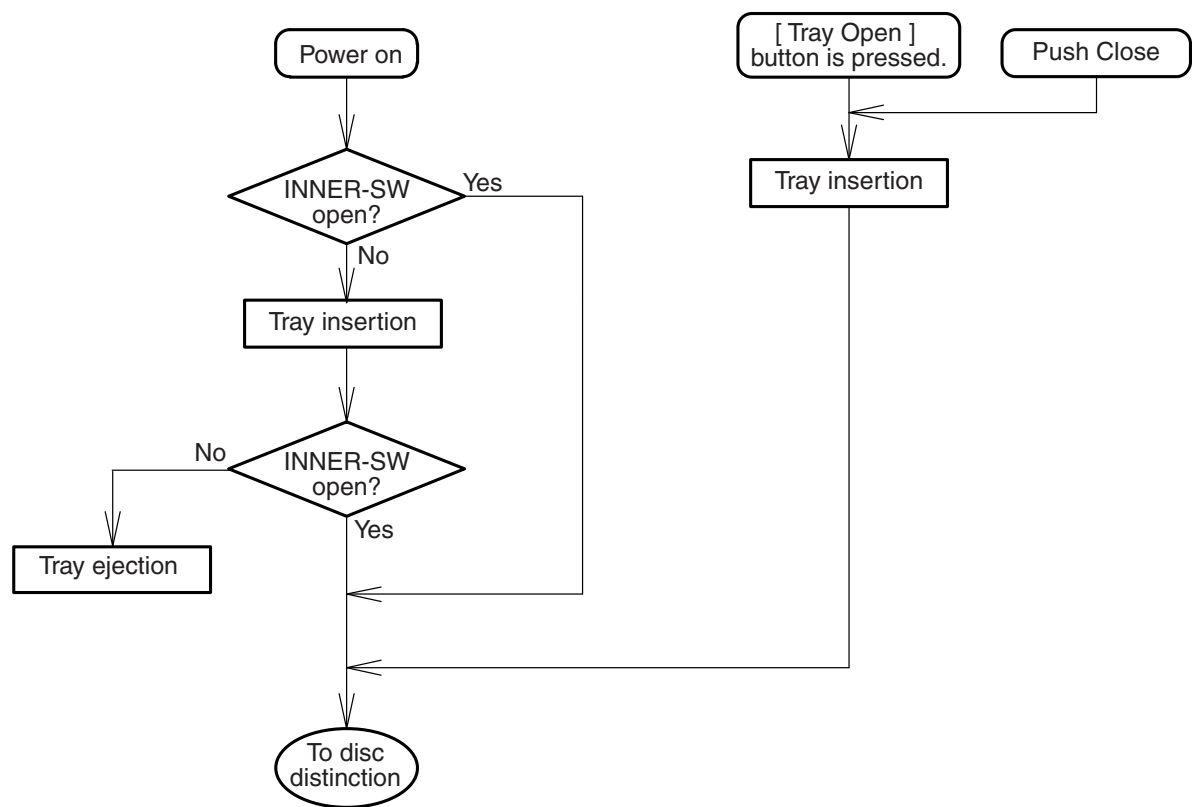


Wiring 2/2 Diagram

NOTE: BOARD MEANS PRINTED CIRCUIT BOARD.



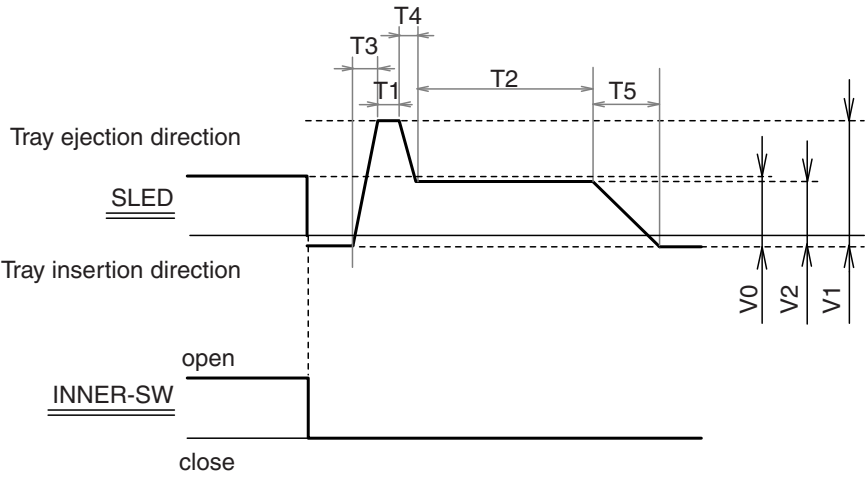
SYSTEM CONTROL TIMING CHARTS



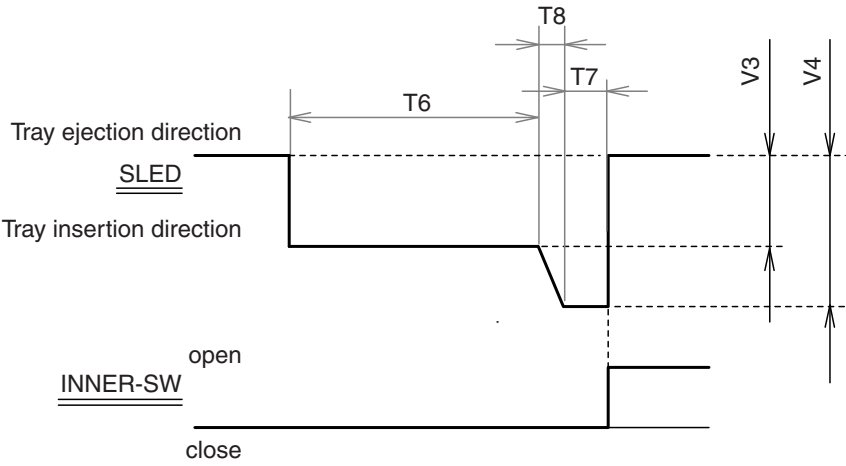
Parameter

V*: Voltage	T*: Event timer
V0: 2.40 V	T1: 0.050 s
V1: 4.25 V	T2: 2.000 s
V2: 2.00 V	T3: 0.008 s
V3: 2.36 V	T4: 0.006 s
V4: 4.26 V	T5: 0.066 s
	T6: 1.500 s
	T7: 0.800 s
	T8: 0.005 s

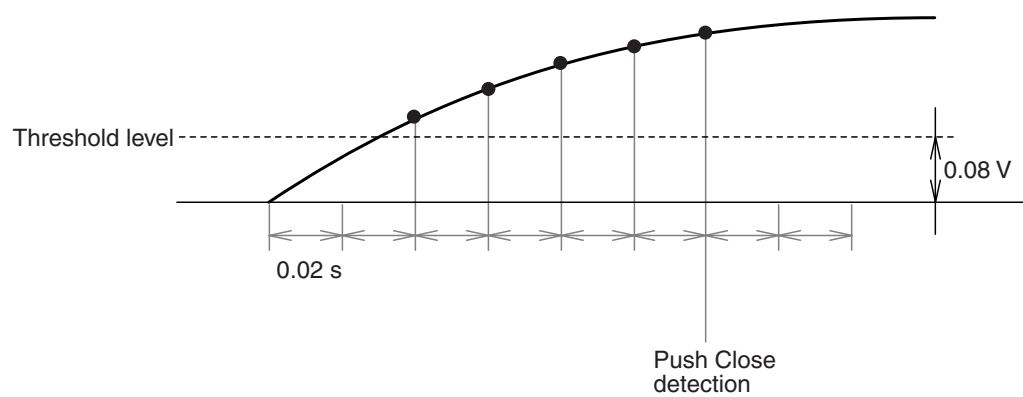
Tray open



Tray close



Push close



IC PIN FUNCTION DESCRIPTIONS

IC009 (SUB MICRO CONTROLLER)

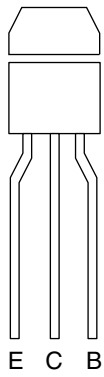
Pin No.	IN/OUT	Signal Name	Function
1	IN	KEY-1	Key Data Input 1
2	IN	KEY-2	Key Data Input 2
3	IN	SAFETY1	Power Supply Protection1
4	IN	AFT	Tuner Voltage Input Signal
5	-	FLASH-VPP	Flash Writing Voltage
6	IN	EV+3.3V	+3.3V Power Supply
7	IN	BUP+3.3V	+3.3V Power Supply
8	OUT	XOUT	Main Clock Output
9	IN	XIN	Main Clock Input
10	-	VSS	Ground
11	IN	XCIN	Sub Clock Input
12	OUT	XCOUT	Sub Clock Output
13	-	GND	Ground
14	IN	RESET	Micro Controller Reset Signal
15	OUT	FAN-CONT1	Fan Motor Control Signal1
16	OUT	FAN-CONT2	Fan Motor Control Signal2
17	OUT	LOW-POWER	Consumption Power Control
18	OUT	SUB-TXD	Transmission Data to Main Micro Controller
19	IN	SUB-RXD	Reception Data from Main Micro Controller
20	OUT	SUB-SCLK	Communication Clock with Main Micro Controller
21	-	NU	Not Used
22	OUT	SYS-RESET	System Reset Signal
23	-	NU	Not Used
24	IN	DAVN-L	VPS/PDC Data Receive = "L"
25	-	NU	Not Used
26	OUT	1V2CONT	Power Regulator Control Signal
27	IN	REMOTE	Remote Signal Input
28	-	NU	Not Used
29	IN	RDY	Ready/Busy communication Control with Main Micro Controller
30	IN	P-DOWN	Power Voltage Down Detector Signal
31	IN	FL-SEL	FL Select
32	-	NU	Not Used

Pin No.	IN/OUT	Signal Name	Function
33	IN/OUT	SDA	Serial Data
34	OUT	SCL	Serial Clock
35	IN/OUT	FLASH-SDA	Serial Data Signal for Flash
36	OUT	FLASH-SCL	Serial Clock Signal for Flash
37	IN	DVD/HDD-AUDIO-MUTE	DVD/HDD-Audio Mute Control Signal
38	OUT	AUDIO-MUTE	Audio Mute Control Signal
39	OUT	SC-AUDIO-MUTE	SCART Jack Audio Mute Control Signal
40	-	NU	Not Used
41	OUT	8PIN-OUT1	Control SCART1 8Pin Level by using 8POUT-1 and 8POUT-2
42	OUT	8PIN-OUT2	Control SCART1 8Pin Level by using 8POUT-1 and 8POUT-2
43	-	NU	Not Used
44	-	NU	Not Used
45	-	NU	Not Used
46	-	NU	Not Used
47	-	NU	Not Used
48	OUT	FL-DIN	FL Serial Data Input
49	OUT	FL-STB	FL Serial Interface Strobe
50	OUT	FL-CLK	FL Serial Clock
51	-	NU	Not Used
52	OUT	REG-CONT	Power Regulator Control Signal
53	OUT	PWR-SW	DVD Power Supply Control Signal
54	OUT	1080p-LED	LED Control Signal
55	OUT	1080i-LED	LED Control Signal
56	OUT	720p-LED	LED Control Signal
57	OUT	480p-LED	LED Control Signal
58	OUT	HDD-LED	HDD LED Control Signal
59	OUT	DVD-LED	DVD LED Control Signal
60	-	NU	Not Used
61	-	AVSS	Ground
62	IN	SAFETY2	Power Supply Protection2
63	IN	AGC	IF AGC Comparator Signal
64	IN	SC2-IN	Input Signal from Pin 8 of SCART2

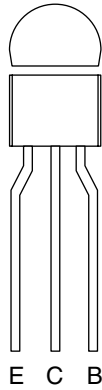
IC3001 (VFD DRIVER)

Pin No.	IN/ OUT	Signal Name	Function
1	IN	CLK	Serial Clock
2	IN	STB	Serial Interface Strobe
3	-	NU	Ground
4	-	NU	Ground
5	-	VSS	Ground
6	-	VDD	+3.3V Power Supply
7	OUT	a	Segment Output
8		b	
9		c	
10		d	
11		e	
12		f	
13		g	
14		h	
15	-	VEE	Pull Down Level
16	OUT	i	Segment Output
17	OUT	7G	Grid Output
18		6G	
19		5G	
20		4G	
21		3G	
22		2G	
23		1G	
24	-	VDD	+3.3V Power Supply
25	-	VSS	Ground
26	IN	OSC	Oscillator Input
27	-	NU	Not Used
28	IN	DIN	Serial Data Input

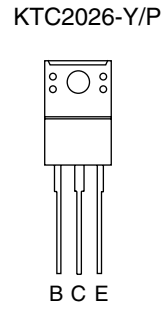
LEAD IDENTIFICATIONS



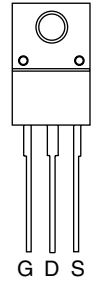
KRC103M-AT/P
KTC3199-(BL,GR,Y)-AT/P
KTA1267-Y-AT/P



KTA1266-Y-AT/P
KTC3198-GR-AT/P
KTC3203-Y-AT/P

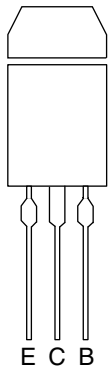


KTC2026-Y/P

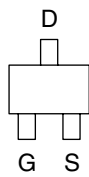


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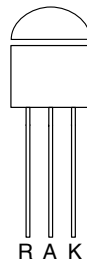
KTC3205-Y-AT/P



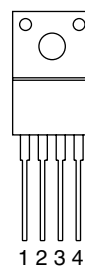
KTK5132S-RTK/P



KIA431-AT/P



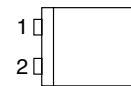
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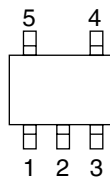


PS2561A-1(W)

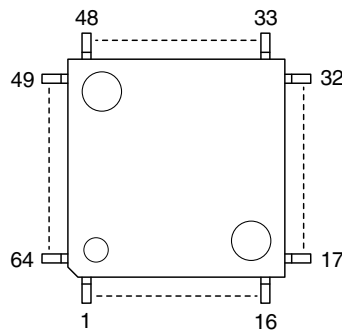


1: Anode
2: Cathode
3: Emitter
4: Collector

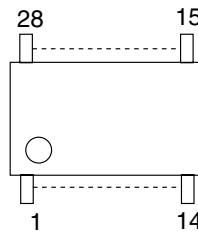
PST3619NR
BU4219G-TR



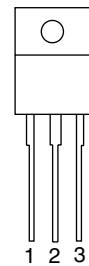
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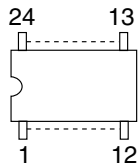
SC16313G



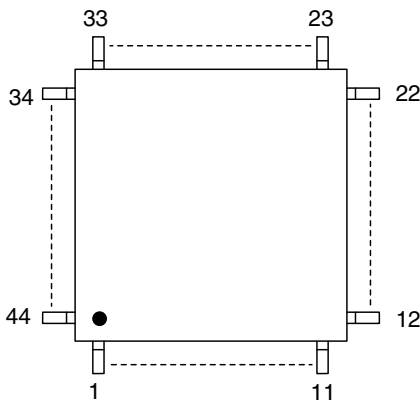
LD1117V



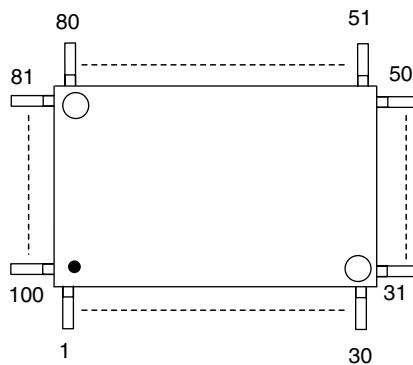
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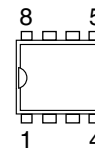
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HA118326APF-E



KIA4558F-EL/P
KIA4558P/P

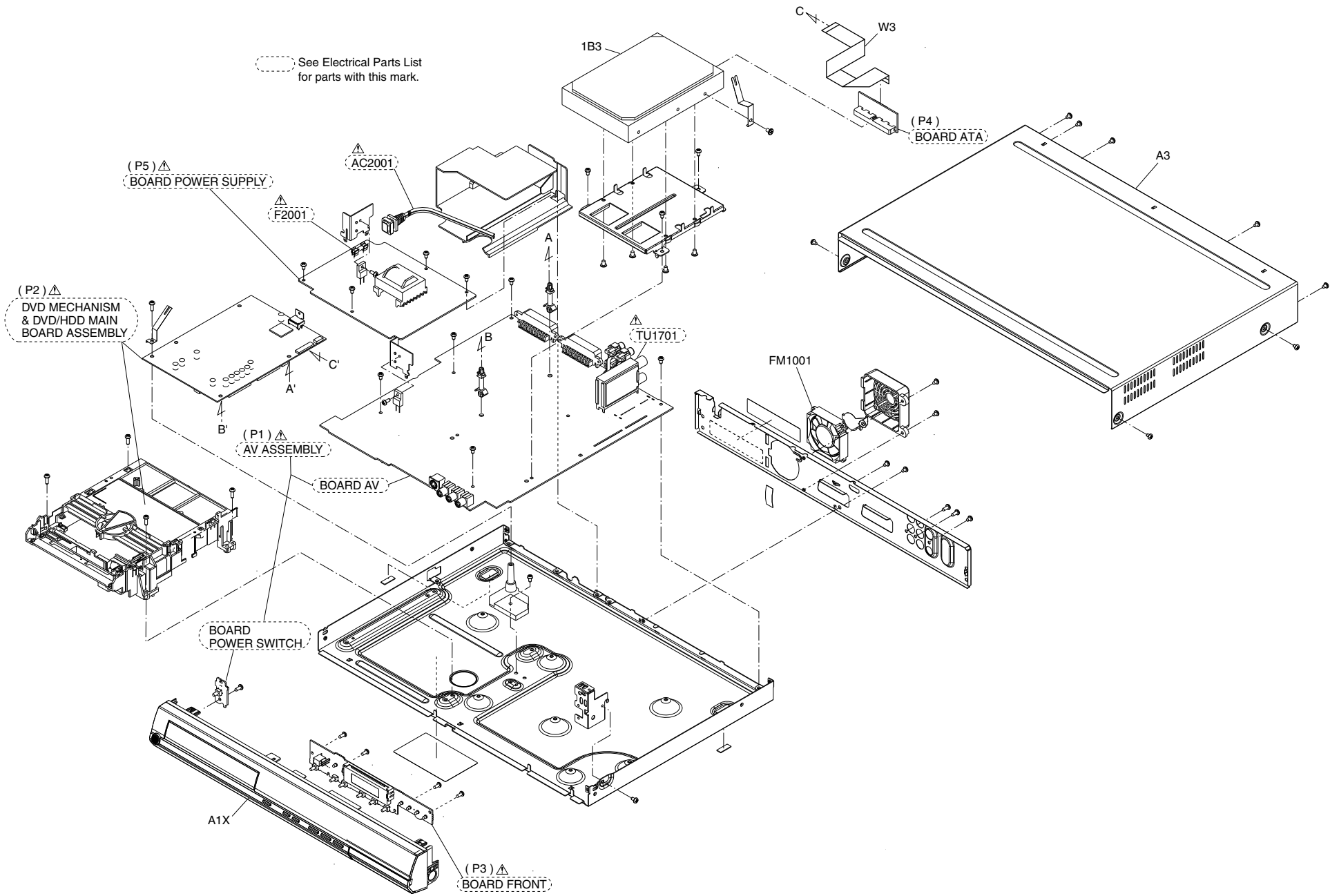


Note:

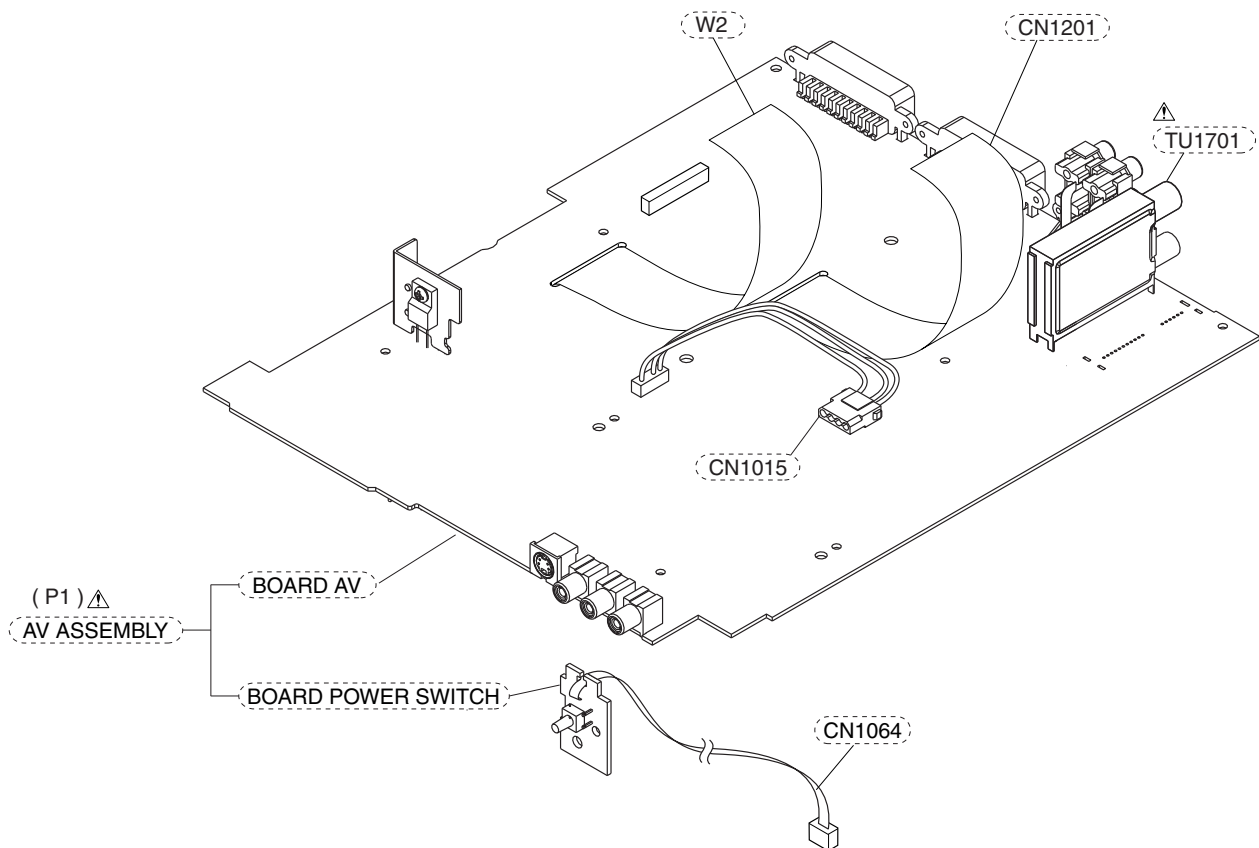
A: Anode
K: Cathode
E: Emitter
C: Collector
B: Base
R: Reference
G: Gate
D: Drain
S: Source

EXPLODED VIEWS

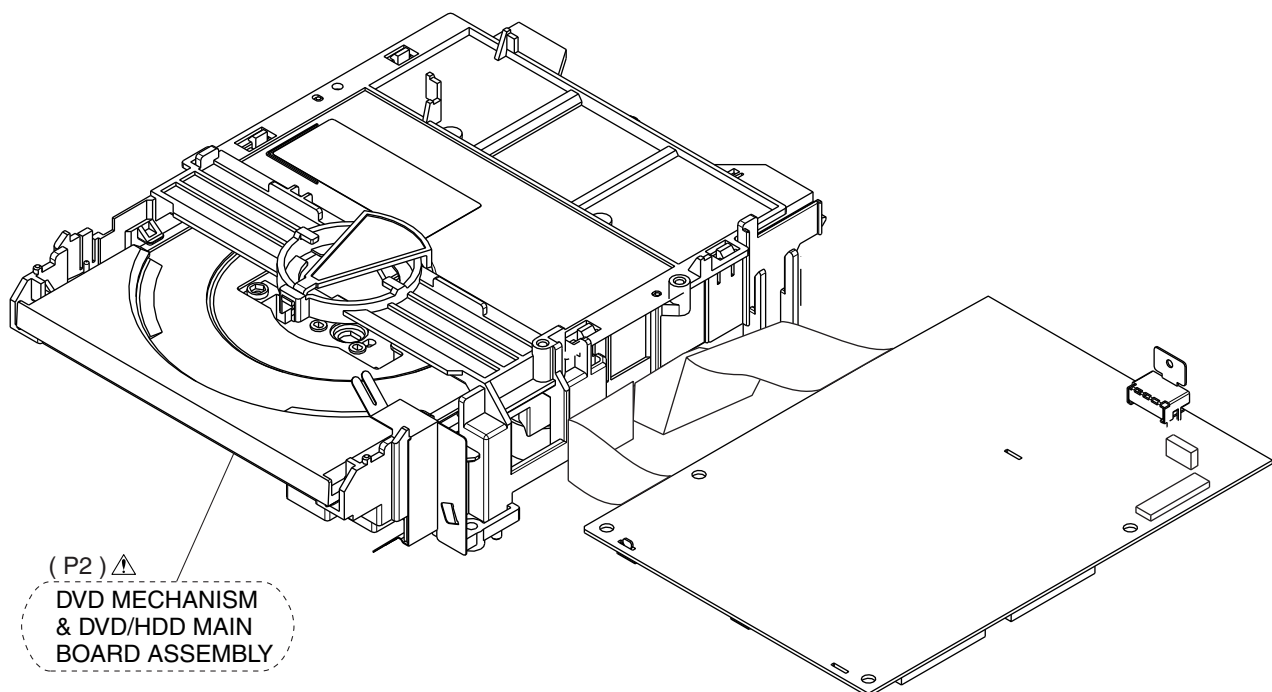
Cabinet



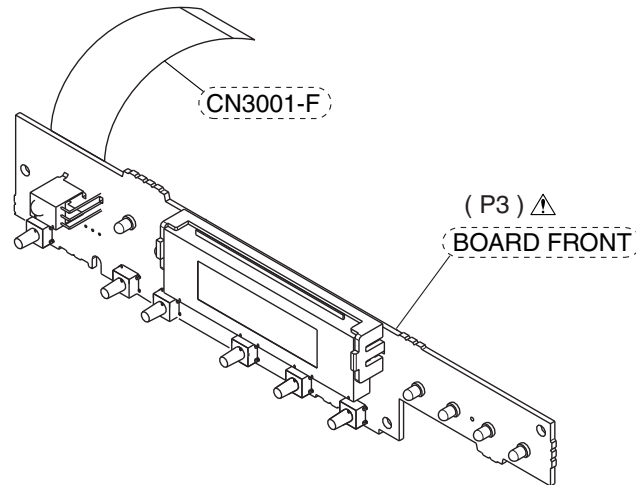
(P1) AV ASSEMBLY



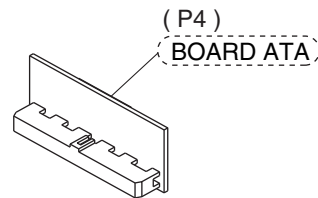
(P2) DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY



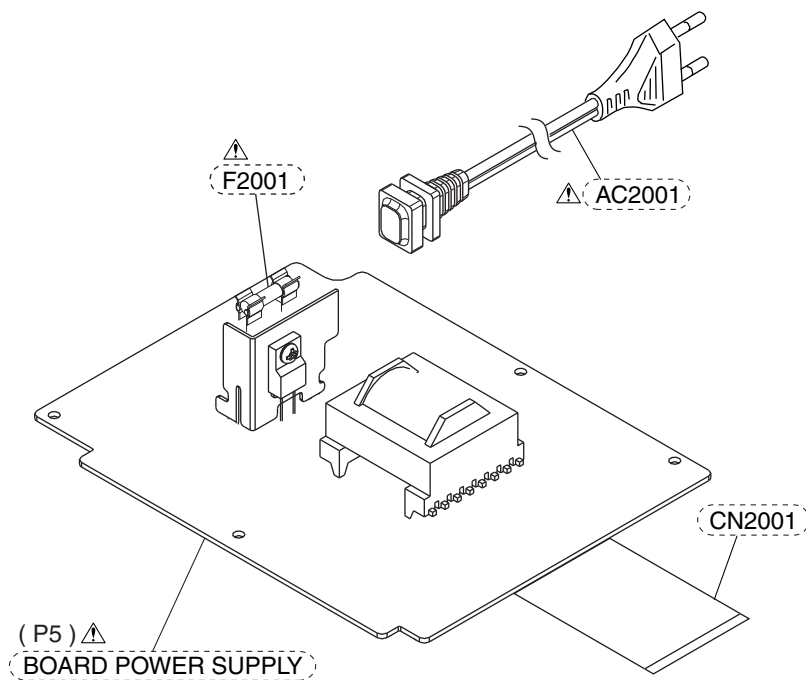
(P3) BOARD FRONT



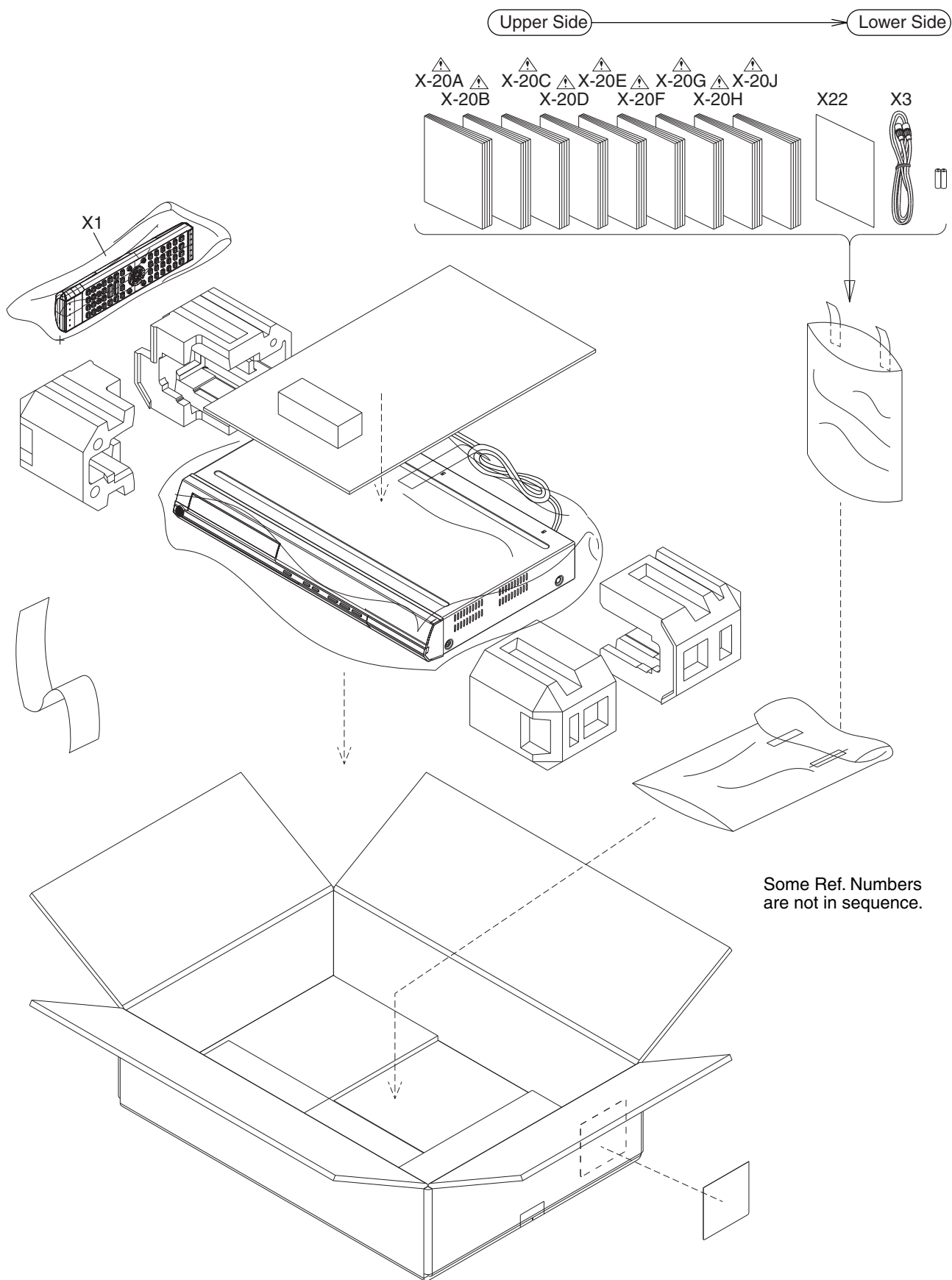
(P4) BOARD ATA




(P5) BOARD POWER SUPPLY













Packing







MECHANICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

	Location No.	TSB P/N	Reference No.	Description
	A1X	P000494890	1VM223760	PANEL FRONT E2G71ED
	A3	P000493370	1VM121104	COVER TOP E2J70BD
	1B3	P000494100	UHDD160WG003	HARD DISK DRIVE 160GB WD1600AV/BB-63SYA0
	FM1001	P000459880	MMEZL12NH008	MOTOR DC FAN D05U-12TS1 09(UX)
	W3	P000493540	WX1E2J70-009	WIRE ASSEMBLY MAIN TO HDD FFC 40P 194MM 40PIN
ACCESSORIES				
	X-20A	P000494900	1VMN24233	OWNERS MANUAL(EN) E2G71ED
	X-20B	P000494910	1VMN24234	OWNERS MANUAL(DE) E2G71ED
	X-20C	P000494920	1VMN24235	OWNERS MANUAL(FR) E2G71ED
	X-20F	P000494950	1VMN24238	OWNERS MANUAL(SV) E2G71ED
	X-20D	P000494930	1VMN24236	OWNERS MANUAL(IT) E2G71ED
	X-20E	P000494940	1VMN24237	OWNERS MANUAL(ES) E2G71ED
	X-20G	P000494960	1VMN24239	OWNERS MANUAL(NE) E2G71ED
	X-20H	P000494970	1VMN24240	OWNERS MANUAL(EL) E2G71ED
	X-20J	P000494980	1VMN24241	OWNERS MANUAL(NO) E2G71ED
	X1	P000494420	NB335ED	REMOTE CONTROL UNIT NB335ED
	X3	P000460030	WPZ0122LG001	RF CORD PAL 1.2M
	X22	P000494990	1VMN24242	QUICK GUIDE E2G71ED

ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE: Products marked with a  have special characteristics important to safety. Before replacing any of these components, read carefully the product safety notice in this service manual. Don't degrade the safety of the product through improper servicing.

	Location No.	TSB P/N	Reference No.	Description
	SA2001	P000457210	NVQZ10D471KB	SURGE ABSORBER 470V+-10PER
	T2001	P000493470	LTT3PE0KT031	TRANS POWER 7725

NOTES:



- Parts that are not assigned part numbers (-----) are not available.
- Tolerance of Capacitors and Resistors are noted with the following symbols.

C.....±0.25% D.....±0.5% F.....±1%



G.....±2% J.....±5% K.....±10%

M.....±20% N.....±30% Z.....+80/-20%



DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY

	Location No.	TSB P/N	Reference No.	Description
	P2	P000495000	N78E8DEN	DVD MECHANISM & DVD/HDD MAIN BOARD ASSEMBLY



AV ASSEMBLY

	Location No.	TSB P/N	Reference No.	Description
	P1	P000494400	1VSA16307	AV ASSEMBLY











BOARD FRONT

	Location No.	TSB P/N	Reference No.	Description
	P3	P000493410	1VSA15874	BOARD FRONT

BOARD ATA

	Location No.	TSB P/N	Reference No.	Description
	P4	P000493440	1VSA16180	BOARD ATA

BOARD POWER SUPPLY

	Location No.	TSB P/N	Reference No.	Description
	P5	P000493810	1VSA16346	BOARD POWER SUPPLY
Following parts are included in P5.				
	C2001	P000493460	CT2E683DC016	ACROSS THE LINE CAP. 0.068μF/250V
	C2002	P000493450	CCN2EMA0E222	SAFETY CAP. 2200pF/250V
	IC2101	P000483270	QPEWPS2561A1	PHOTOCOUPLER PS2561A-1(W)
	L2001	P000483800	LLEG0Z0TU001	COIL LINE FILTER 56MH TLF24HB5630R3
	Q2101	P000493500	QFWZ2SK3798Q	MOS FET 2SK3798(Q)
	R2001	P000493510	RXX2565MGL01	GLASS GLAZE RES. 1/2W J 5.6M Ω
	AC2001	P000468380	WAE0172LW011	POWER CORD PE8G2CG9G0AB05
	F2001	P000483870	PEG20B0W3002	FUSE TIME RAG TSD2A250VSVDEUC3CPSE

TOSHIBA CORPORATION

1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN